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OFFICIAL GAZETTE

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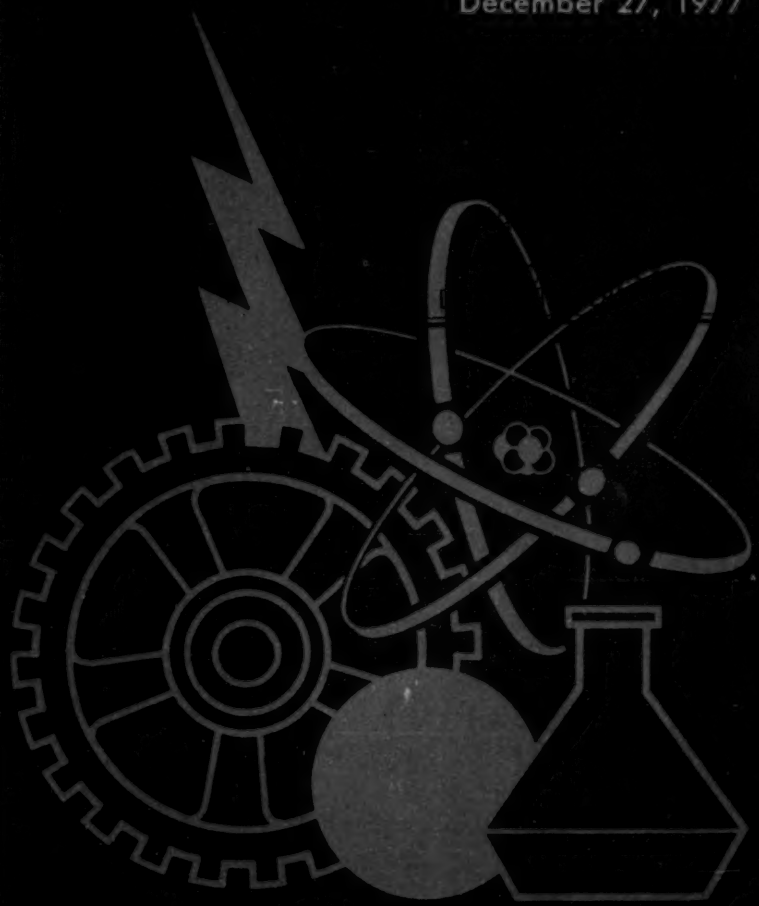
PATENTS

December 27, 1977



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

December 27, 1977 Volume 965 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of November 1977

Affirmed	175
Affirmed in Part	33
Reversed	71
Total	279

National Inventors Day

The Sixth Annual Inventors Day Exposition will be held on Saturday and Sunday, February 11 and 12, 1978 at the Patent and Trademark Office in Arlington, Virginia.

Limited space is available for appropriate display and demonstration of patented materials, devices or methods. Such limited space dictates early consideration by perspective participants. No application can be considered after January 20, 1978.

Other than electricity and allotted space—floor, wall or table top, all expenses must be borne by the exhibitor. Arrangements for delivery, return, set up and take down, as well as individual exhibits and personnel are the exhibitor's responsibility. Neither the Patent and Trademark Office nor individual employees can accept a collect shipment or provide storage.

The Patent and Trademark Office National Inventors Day Committee will select the items to be exhibited and allot available space. Suitability for dynamic demonstration and current public interest are prime consideration in selecting exhibits.

Inventors or firms interested in participating are encouraged to contact the National Inventors Day Committee (phone: 557–3428). Communications should be directed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attn: Oscar Mastin, Office of Information Services.

JOSEPH PETERS,
Chairman.

Dec. 7, 1977

National Inventors Day

The Patent and Trademark Office will be sponsoring National Inventors Day in the Public Search Room on Saturday, February 11, from 1:00 p.m. to 5:00 p.m. and Sunday February 12, 1978 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend a formal program at 2:00 p.m. on Sunday.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5:00 p.m. on Friday, February 10, 1978.

We would appreciate the cooperation of all users of the Search Room facilities in removing all personal items and belongings in order to permit the early closing time.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Dec. 7, 1977

Registration to Practice

The following are names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before January 20, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks and Chairman, Committee on Enrollment.

11/28/77.

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REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,129,382, Re. S.N. 846,630, Filed Oct. 28, 1977, Cl. 323/43.5, ROTARY POTENTIOMETER WITH SPEED REDUCTION GEARING, Larkin B. Scott, Owner of Record: *Perkin-Elmer Corporation, Norwalk, Conn.,* Attorney or Agent: Salvatore A. Giarratana, et al., Ex. Gp.: 212

3,407,388, Re. S.N. 846,358, Filed Oct. 28, 1977, Cl. 340/152 R, CUSTOMER SERVICE UNIT, Robert N. Goldman, Owner of Record: *Telecredit, Inc., Wilmington, Del.,* Attorney or Agent: Edward J. Brenner, et al., Ex. Gp.: 234

3,789,299, Re. S.N. 846,629, Filed Oct. 28, 1977, Cl. 324/95, PROBE FOR RADIATION DETECTOR, Edward E. Aslan, Owner of Record: *The Narda Microwave Corporation, Plainview, N.J.,* Attorney or Agent: Granville M. Brumbaugh, et al., Ex. Gp.: 252

3,847,356, Re. S.N. 842,021, Filed Oct. 14, 1977, Cl. 239/662, SCRAPING PADDLES FOR UNLOADING AND SPREADING MECHANISM USED WITH MANURE SPREADERS, Allison W. Blanshine, Owner of Record: *Sperry Rand Corporation, New Holland, Pa.,* Attorney or Agent: Frank A. Seemar, et al., Ex. Gp.: 313

3,851,872, Re. S.N. 789,891, Filed Apr. 22, 1977, Cl. 271/173, SORTING APPARATUS FOR COLLATING SIMPLEX AND DUPLEX COPIES, Dennis P. Gerbasi, Owner of Record: *Xerox Corporation, Stamford, Conn.,* Attorney or Agent: Melvin A. Klein, Ex. Gp.: 313

3,858,298, Re. S.N. 845,577, Filed Oct. 26, 1977, Cl. 29/237, SWAGING APPARATUS, Jon K. Whitledge, et al., Owner of Record: *Samuel Moore and Company, Mantua, Ohio,* Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 323

3,929,186, Re. S.N. 843,080, Filed Oct. 17, 1977, Cl. 165/49, THERMALLY INSULATING WALL UNITS, Otto Alfred Becker, Owner of Record: *Inventor,* Attorney or Agent: Thomas E. Beall, Jr., et al., Ex. Gp.: 342

3,975,725, Re. S.N. 845,012, Filed Oct. 25, 1977, Cl. 340/324 M, DISPLAY PANEL AND SYSTEM FOR OPERATING THE SAME, James A. Ogle, Owner of Record: *Burroughs Corporation, Detroit, Mich.,* Attorney or Agent: Robert A. Green, Ex. Gp.: 234

3,978,371, Re. S.N. 845,104, Filed Oct. 25, 1977, Cl. 315/169 TV, DISPLAY PANEL USING GLOW SPREADING PRINCIPLES, Donald E. Miller, Owner of Record: *Burroughs Corporation, Detroit, Mich.,* Attorney or Agent: Robert A. Green, Ex. Gp.: 256

3,993,526, Re. S.N. 846,107, Filed Oct. 27, 1977, Cl. 156/202, METHOD OF AND APPARATUS FOR MAKING BONDED BELT LOOPS, Joseph W. A. Off, et al., Owner of Record: *Haggar Company, Dallas, Tex.,* Attorney or Agent: Michael A. O'Neil, Ex. Gp.: 161

4,045,910, Re. S.N. 846,781, Filed Oct. 31, 1977, Cl. 47/2, METHOD FOR REDUCING FROST DAMAGE OF PLANTS, Deane C. Arny, et al., Owner of Record: *Wisconsin Alumni Research Foundation, Madison, Wis.,* Attorney or Agent: Dugald S. McDougall, et al., Ex. Gp.: 337

PATENT NOTICES

Certificates of Correction for the Week of Dec. 27, 1977

Re. 29,191	4,005,747	4,037,785	4,046,668
D. 245,345	4,008,532	4,038,185	4,046,702
3,513,255	4,011,608	4,038,448	4,046,982
3,785,840	4,012,694	4,038,451	4,047,110
3,819,661	4,012,821	4,038,485	4,047,367
3,824,230	4,016,193	4,039,128	4,047,386
3,836,578	4,016,249	4,039,143	4,047,491
3,843,309	4,016,542	4,039,406	4,047,682
3,843,712	4,017,186	4,039,541	4,047,770
3,857,651	4,017,619	4,040,390	4,047,902
3,859,484	4,019,539	4,040,427	4,048,038
3,867,380	4,019,784	4,040,488	4,048,137
3,883,574	4,020,865	4,040,736	4,048,216
3,914,282	4,022,786	4,040,878	4,048,220
3,914,683	4,022,916	4,041,007	4,048,576
3,917,581	4,023,454	4,041,150	4,049,032
3,919,285	4,025,302	4,041,272	4,049,210
3,919,286	4,025,341	4,041,406	4,049,230
3,920,643	4,026,264	4,041,614	4,049,320
3,922,297	4,027,001	4,041,617	4,049,399
3,926,553	4,028,155	4,041,758	4,049,558
3,942,253	4,028,799	4,041,794	4,049,685
3,942,805	4,029,718	4,042,293	4,049,716
3,948,970	4,030,203	4,042,486	4,049,758
3,949,142	4,030,897	4,042,499	4,049,767
3,959,346	4,031,170	4,042,728	4,049,881
3,959,764	4,031,337	4,042,743	4,049,893
3,960,502	4,031,675	4,042,907	4,050,042
3,966,962	4,032,266	4,043,020	4,050,055
3,968,111	4,032,317	4,043,596	4,050,138
3,968,200	4,032,549	4,043,990	4,050,204
3,974,200	4,033,015	4,044,040	4,050,321
3,984,174	4,033,257	4,044,330	4,050,393
3,988,951	4,033,466	4,044,347	4,050,509
3,994,883	4,035,435	4,044,576	4,050,561
3,997,781	4,035,467	4,044,668	4,051,383
3,997,901	4,035,531	4,045,085	4,051,691
4,000,485	4,035,818	4,045,206	4,051,895
4,001,060	4,036,078	4,045,363	4,052,164
4,001,106	4,036,286	4,045,495	4,052,165
4,001,317	4,036,299	4,046,151	4,055,209
4,002,175	4,036,659	4,046,380	
4,003,037	4,036,693	4,046,381	
4,003,620	4,037,003	4,046,427	

Disclaimers

3,322,578.—*Ivan P. Thompson*, Hillside, N.J. THERMOCHEMICAL DESURFACING METHOD. Patent dated May 30, 1967. Disclaimer filed Aug. 26, 1977, by the assignee, *Union Carbide Corporation*.

Hereby enters this disclaimer to claims 1 to 7 of said patent.

3,391,392.—*Harold W. Doyle*, Newport Beach, Calif. METHOD AND APPARATUS FOR PATTERN DATA PROCESSING. Patent dated July 2, 1968. Disclaimer filed Oct. 3, 1977, by the assignee, *California Computer Products, Inc.*

Hereby enters this disclaimer to claims 1 through 14 of said patent.

3,676,724.—*Don A. Berlincourt, Chagrin Falls*, and *Kendall A. Pim*, Cleveland Heights, Ohio. MULTI-ELEMENT PIEZOELECTRIC CIRCUIT COMPONENT. Patent dated July 11, 1972. Disclaimer filed Oct. 20, 1977, by the assignee, *Vernitron Corporation*.

Hereby enters this disclaimer to claims 16 to 21 of said patent.

3,702,441.—*Keith R. Thrower*, Bracknell, England FREQUENCY SYNTHESIZING SYSTEM. Patent dated Nov. 7, 1972. Disclaimer filed Aug. 8, 1977, by the assignee, *John Fluke Mfg. Co., Inc.*

Hereby enters this disclaimer to claims 1–6 of said patent.

3,750,418.—*Wendell E. Maudlin*, York, Pa. EVAPORATOR AND CONDENSATE COLLECTOR ARRANGEMENT FOR REFRIGERATION APPARATUS. Patent dated Aug. 7, 1973. Disclaimer filed Oct. 14, 1977, by the assignee, *Borg-Warner Corporation*.

Hereby enters this disclaimer to claim 1 of said patent.

3,805,602.—*Curtis L. Erwin, Jr.*, Portland, Oreg. FUEL USE RATE METER FOR ENGINES. Patent dated Apr. 23, 1974. Disclaimer filed Oct. 17, 1977, by the inventor.

Hereby enters this disclaimer to claims 18 through 24 of said patent.

3,852,149.—*Matthew M. Sitter*, Convent Station, N.J., *Robert M. Meyers*, Fairless Hills, Pa., and *Edward F. Kutch*, Trenton, N.J. INSULATING GLASS WINDOW ASSEMBLIES. Patent dated Dec. 3, 1974. Disclaimer filed Oct. 14, 1977, by the assignee, *Norton Company*.

Hereby enters this disclaimer to claims 1 through 14 of said patent.

3,906,168.—*James Royce McEowen*, Holmdel Township, Monmouth, N.J. VISUAL STATUS INDICATOR CIRCUIT. Patent dated Sept. 16, 1975. Disclaimer filed Oct. 25, 1977, by the assignee, *Bell Telephone Laboratories, Incorporated*.

Hereby enters this disclaimer to claims 1, 2, 3, 4, 9, 13, 14 and 15 of said patent.

3,916,479.—*Howard W. Parker*, Westboro, and *Arlon G. Sangster*, Sterling, Mass. HINGE AND DETENT MECHANISM. Patent dated Nov. 4, 1975. Disclaimer filed Oct. 12, 1977, by the assignee, *Jamesbury Corp.*

Hereby enters this disclaimer to claims 1, 5, and 6 of said patent.

3,925,947.—*Robert M. Meyers*, Fairless Hills, Pa., and *Edward F. Kutch*, Trenton, and *Matthew M. Sitter*, Convent Station, N.J. AUTOMOBILE WINDOW SEALING. Patent dated Dec. 16, 1975. Disclaimer filed Oct. 14, 1977, by the assignee, *Norton Company*.

Hereby enters this disclaimer to claims 1 through 11 of said patent.

3,944,235.—*Alexander L. Gordon*, Worcester, Mass. GASKET WITH HEAT INSULATING PROPERTIES. Patent dated Mar. 16, 1976. Disclaimer filed Oct. 12, 1977, by the assignee, *Federal-Mogul Corporation*.

Hereby enters this disclaimer to claim 10 of said patent.

3,944,469.—*James Long Bittle*, Doylestown, Pa., and *Wayne J. Rubic*, Titusville, N.J. FELINE CALICIVIRUS VACCINE AND PRODUCTION THEREOF. Patent dated Mar. 16, 1976. Disclaimer filed Sept. 19, 1977, by the assignee, *Pitman-Moore, Inc.*

The term of this patent subsequent to Feb. 10, 1993, has been disclaimed.

3,995,532.—*John A. Junck*, Joliet, and *Larry W. Lorimor*, Crest Hill, Ill. PROPORTIONAL CONTROL VALVE WITH PRECONDITIONED INLET MODULATING RELIEF VALVE. Patent dated Dec. 7, 1976. Disclaimer filed Oct. 12, 1977, by the assignee, *Caterpillar Tractor* Co.

Hereby enters this disclaimer to claims 6 and 7 of said patent.

4,006,488.—*Makoto Kuboshima*, Ashigara, Japan, BELLOWS FOR USE IN A FOLDABLE CAMERA. Patent dated Feb. 1, 1977. Disclaimer filed Oct. 18, 1977, by the assignee, *Fuji Photo Film Co., Ltd.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,050,895.—*Edgar E. Hardy*, Kettering, and *Donald J. David*, Centerville, Ohio. OPTICAL ANALYTICAL DEVICE, WAVEGUIDE AND METHOD. Patent dated Sept. 27, 1977. Disclaimer filed Oct. 11, 1977, by the assignee, *Monsanto Research Corporation.*

The term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Dedications

3,533,201.—*William R. Tyler*, Lower Burrell, Pa. FASCIA AND FLASHING CONSTRUCTION. Patent dated Oct. 13, 1970. Dedication filed Oct. 7, 1977, by the assignee, *Aluminum Company of America.*

Hereby dedicates to the Public the remaining term of said patent.

3,943,814.—*Henry Wemekamp*, Willowdale, Ontario, Canada. ELECTRIC ORGAN TONE GENERATING SYSTEM. Patent dated Mar. 16, 1976. Dedication filed Aug. 22, 1977, by the assignee, *Computeacher Limited.*

Hereby dedicates to the Public the remaining term of said patent.

3,995,386.—*Hassan Paddy Abdel Salam*, London, England. INFORMATION DISPLAY DEVICE. Patent dated Dec. 7, 1976. Disclaimer filed Oct. 11, 1977, by the assignee, *Air Products and Chemicals, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

4,027,241.—*Jeremy P. Jauch*, Kearny, N.J. SOLID STATE WATT AND VAR TRANSDUCER. Patent dated May 31, 1977. Dedication filed Oct. 3, 1977, by the assignee, *Westinghouse Electric Corporation.*

Hereby dedicates to the Public the entire term of said patent.

Availability of U.S. Patent Classification Microfilm Publications

The Patent and Trademark Office announces the availability of new editions of two patent classification microfilm publications: "U.S. Patent Classification—Subclass Listing" (PTO 002.1–7710M) and "Patent Number Sequence Classification Record" (PTO 001.1–7710M, previously entitled "Classification of U.S. Patents"). Both publications are dated October 1977 and reflect new patent issues and reclassifications through the end of the month.

The "U.S. Patent Classification—Subclass Listing" presents in sequence by the classes, subclasses, and digest of the U.S. classification system, the patent numbers of the U.S. patents which are classified as "originals," "cross references," and "unofficial cross references" in each of the subclasses. Within each subclass, the patent numbers are listed in numerical sequence. Symbols appear in conjunction with patent numbers to denote those patents which are classified as cross references in a subclass.

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Reel Number	NTIS Accession Number*	Classes (contents)
1–9 (Full set)	PB 269 981	All.
1	PB 269 982	Designs, Plants, Cl.2–42/68.
2	PB 269 983	42/69–81/186.
3	PB 269 984	81/186–134/133.
4	PB 269 985	134/133–198/308.
5	PB 269 986	198/308–241/101.7
6	PB 269 987	241/101.7–264/182.
7	PB 269 988	264/182–330/128.
8	PB 269 989	330/128–426/263.
9	PB 269 990	426/263–560/266.

Patent Number Sequence Classification Record

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Reel Number	NTIS Accession Number*	Beginning Patent Number	Ending Patent Number
1–22 (Full set)	PB 269 991	All	
15–22 (Partial set)	PB 269 992	2,811,720 [1]	4,055,851
1	PB 269 993	See below [2]	
2	PB 269 994	6,898	269,043
3	PB 269 995	269,044	515,598
4	PB 269 996	515,599	754,241
5	PB 269 997	754,242	990,090
6	PB 269 998	990,091	1,221,658
7	PB 269 999	1,221,659	1,452,907
8	PB 270 000	1,452,908	1,676,786
9	PB 270 001	1,676,787	1,890,050
10	PB 270 002	1,890,051	2,084,604
11	PB 270 003	2,084,605	2,271,979
12	PB 270 004	2,271,980	2,455,944
13	PB 270 005	2,455,945	2,635,165
14	PB 270 006	2,635,166	2,811,719
15	PB 270 007	2,811,720	2,990,115
16	PB 270 008	3,990,116	3,162,540
17	PB 270 009	3,162,541	2,330,051
18	PB 270 010	3,330,052	3,503,583
19	PB 270 011	3,503,584	3,683,126
20	PB 270 012	3,683,127	3,862,558
21	PB 270 013	3,862,559	4,034,583
22	PB 270 014	4,034,584	4,055,851

* Insert the letter code representing choice of one of the follwing optional means of receiving the film:
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M = Reels in 3M cartridges.
R = Reels in Recordak cartridges.
T = Reels in "Thread Easy" magazines.

[1] Issued in October 1957.
[2] Reel 1 includes the following ranges of numbers:

"Additional Improvements"	AI2–AI318
Design Patents	D1–D246,205
Plant Patents	PP1–PP4,137
Reissue Designs	RD301–RD25,414
Reissue Patents	RE1–RE29,461
Reissue Patents Issued Prior to 1836	RX35–RX112
Defensive Publications	T856,001–T963,004
Patents Issued Prior to 1836	X1–X11,280
Patents	1–6,897

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ALFRED C. MARMOR,
Nov. 23, 1977. *Administrator for Documentation.*

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 3, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-3-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-21-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-7-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-6-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-3-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-18-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-8-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-24-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-5-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-15-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-1-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	11-8-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-2-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-1-77

Expiration of patents: The patents within the range of numbers indicated below expire during December 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,962,719 to 2,966,680, inclusive
Plant Patents..... Numbers 1,991 to 2,008, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,501

DEODORIZER SHEET MATERIAL AND INSOLE

Herbert Lapidus, Ridgefield, Conn., assignor to Combe Incorporated, White Plains, N.Y.

Original No. 3,842,519, dated Oct. 22, 1974, Ser. No. 326,757, Jan. 26, 1973. Application for reissue Oct. 20, 1976, Ser. No. 734,185

Int. Cl.[2] A43B *13/38*

U.S. Cl. 36—44 43 Claims

1. A shoe insert for absorbing odors resulting from perspiring feet comprising a cured sheet of [opencelled] *open-celled* foam, at least one side of the sheet having a relatively smooth skin formed during curing which is impervious to passage of charcoal particles, said foam containing homogeneously distributed through the solid part thereof finely divided activated charcoal particles in an amount effective to absorb odors when said sheet is subjected to contact with foot perspiration and to passage of odor-filled air through interstitial spaces within said foam, said charcoal particles having been incorporated prior to frothing and curing of said foam.

Re. 29,502

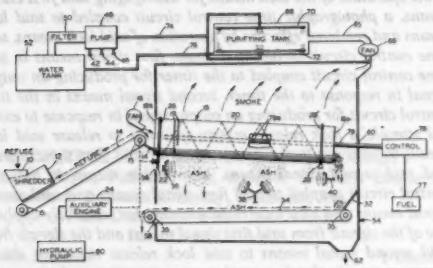
FURNACE APPARATUS

John C. Jaronko, and John T. Jaronko, both of New Britain, Conn., assignors to Nutmeg Sanitation, Inc., New Britain, Conn.

Original No. 3,906,874, dated Sept. 23, 1975, Ser. No. 393,021, Aug. 30, 1973. Application for reissue Jan. 15, 1976, Ser. No. 649,451

Int. Cl.[2] F23B *1/32;* F23G *5/06*

U.S. Cl. 110—14 8 Claims



1. [A mobile] *An* apparatus for collecting and burning refuse comprising:

a chassis [having wheels for movement between collection and and disposal points and] having thereon the following structures:

a hopper disposed on said chassis for receiving refuse;

a shredder communicating with said hopper for reducing the size of the refuse received by said hopper to particles suitable for burning;

a first transfer means for receiving refuse conditioned by said shredder;

[a cylindrical member] *an elongated hollow chamber* having a perforate skin for allowing passage of ash therethrough and having first and second ends, said first end communicating with said first transfer means for receiving said refuse;

means for urging at least some of said refuse through said [cylindrical member] *chamber* to said second end;

a fan communicating with said [cylindrical member] *chamber* for supplying air to the interior of said [cylindrical member;] *chamber;*

a hollow tube disposed generally co-axially with respect to said [cylindrical member] *chamber* and having a plurality of apertures disposed substantially uniformally about the circumference [of said apertures], said apertures being sized for burning a fuel;

a fuel supply and control means for supplying fuel to said hollow tube;

a liquid supply and a liquid spray means for wetting ash passing out of said [cylindrical member] *chamber* through said perforate skin and said second end of said [cylindrical membr;] *chamber;*

second transfer means for moving ash from said [cylindrical member;] *chamber;*

an ash receiving means disposed in communication with said second transfer means;

a substantially closed housing mounted on said chassis and enclosing said [cylindrical member] *chamber,* liquid [spary] *spray* means, second transfer means and at least a portion of said hollow tube;

a second fan in fluid communication with said substantially closed housing urging smoke from the area of said substantially closed housing; and

a purifying tank for washing the smoke conducted by said second fan and in fluid communication with said fan.

Re. 29,503

APPARATUS FOR USE AS A GAS COMPRESSOR OR BLOWER

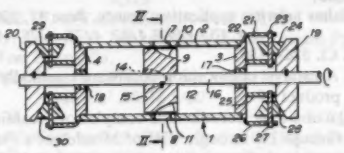
John Maximilian Jules Varga, Halifax, England, assignor to Carding Specialists (Canada) Limited, Toronto, Canada

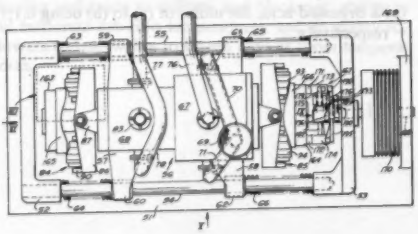
Original No. 3,930,762, dated Jan. 6, 1976, Ser. No. 377,795, July 9, 1973. Application for reissue Feb. 14, 1977, Ser. No. 768,357

Claims priority, application United Kingdom, July 11, 1972, 32296/72

Int. Cl.[2] F04B *7/06, 39/02*

U.S. Cl. 417—492 9 Claims





1. A gas compressor or blower comprising a cylinder having air intake and exhaust ports; a piston which is rotatably and reciprocably movable in the cylinder; valve means for admitting air into and exhausting air from at least one chamber lying to one side of the piston; a piston shaft to which the piston is secured, the piston shaft passing through seals at the axial ends

of the cylinder; means for applying a rotary drive to the piston [rod] *shaft*; and a cam arrangement for causing reciprocation of the piston [rod] *shaft* as it rotates; the arrangement of ports and valve means being such that as the piston rotates and reciprocates air is induced into the chamber, is compressed in the chamber and then exhausted from the chamber; means for axially balancing the piston shaft comprising support means, and means for mounting said cylinder on said support means so that said cylinder has free axial movement on said support means.

Re. 29,504

UNSATURATED HYDROCARBONS POLYMERIZATION CATALYSTS CONTAINING TRANSITION METAL COMPLEXES AND BRØNSTED ACIDS

Francois Dawans, Brussels, Belgium, and Philippe Teyssie, Vesinet, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Original No. 3,497,488, dated Feb. 24, 1970, Ser. No. 558,244, June 17, 1966. Application for reissue Sept. 22, 1970, Ser. No. 74,537

Claims priority, application France, June 17, 1965, 65.21306

Int. Cl.[2] C08F *4/82, 4/76, 4/78*

U.S. Cl. 526—135 **31 Claims**

1. A catalyst composition consisting essentially of the reaction product of

(a) a non-ionic coordination complex of a transition metal of Groups IV through VIII of Mendeleev's Periodic Table as the nuclear atom, and unsaturated hydrocarbon as ligand, said hydrocarbon having at least one pair of π electrons; and

(b) a Brønsted acid, the molar of (a) to (b) being 0.1:1 to 3:1 respectively.

Re. 29,505

ELECTRIC CONTROL DEVICE FOR A CAMERA

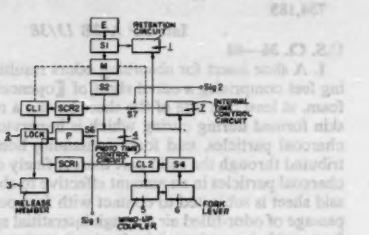
Hiroshi Aizawa, Machida, and Mitsutoshi Ogiso, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 3,812,510, dated May 21, 1974, Ser. No. 319,743, Dec. 29, 1972. Application for reissue Mar. 6, 1975, Ser. No. 555,729

Claims priority, application Japan, Dec. 30, 1973, 47-1089

Int. Cl.[2] G03B *7/00, 9/28*

U.S. Cl. 354—235 **22 Claims**



10. In a camera having a shutter capable of being wound and a shutter release member, comprising a rotatable motor, a first electro-magnetic clutch means coupled to the shutter for releasing the shutter and coupleable to the motor, a second electro-magnetic clutch means coupled to the shutter for winding the shutter and coupleable to the motor being rotated, a first clutch control means coupled to the first electro-magnetic clutch means and the release member for engaging said first clutch means in response to operation of the release member, a lock means coupled to the release member and said first electro-magnetic clutch means for locking the release member in a release position when the first electro-magnetic clutch means is engaged, a first switch means responsive to the operation of the lock means for disengaging said first clutch means, a photographic time control circuit coupled to said lock means and rendered effective by operation of said lock means, said time control circuit including a timer, first signal means in said time control circuit coupled to the timer for producing an output signal in response to the timer, second signal means in the time control circuit for producing an output signal in response to external stimuli, a lock release means operative to release said lock means in response to the output signal of said first signal means and said second signal means, a switching means in the time control circuit coupled to said first signal means and said second signal means and said lock release means for selectively applying one of the signals from said first signal means and the signals from said second signal means to said lock release means, a second electro-magnetic clutch control means responsive to the operation of said lock release means for engaging said second clutch means to wind the shutter, a second switch means coupled to the shutter and coupled to said second clutch means for disengaging said second clutch means in response to the shutter being wound.

PLANT PATENTS

GRANTED DECEMBER 27, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,169
PEAR TREE

Guiseppe Crisafulli, Sr., deceased, late of Glendive, Mont., by Joseph Crisafulli, Jr., executor, P.O. Box 1051, Glendive, Mont. 59330

Filed July 19, 1976, Ser. No. 706,742
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—36 1 Claim

1. A new and distinct variety of pear tree, substantially as illustrated and described, which is medium to slow growing, semi-dwarf, spreading, exceptionally hardy, resistant to fireblight, and a regular and light to moderately productive bearer of medium-size good-keeping fruit, of good flavor and quality, having yellow skin with a red blush and creamy white flesh, the flesh being of smooth texture with few stone cells, juicy and subacid.

4,170
PEACH TREE-MUTATION OF LORING VARIETY

Frederick Beyer, Puducah, Ky., assignor to Stark Brothers Nurseries & Orchards Company, Louisiana, Mo.

Filed Dec. 6, 1976, Ser. No. 747,683
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—43 1 Claim

1. A new and distinct variety of peach tree, substantially as illustrated and described, which bears fruit of excellent quality which ripens approximately 10 to 14 days earlier than the fruit of the Loring Peach variety (unpatented), and develops a more intense red blush over nearly all of its surface approximately 8 to 10 days prior to harvest maturity.

4,171
PEACH TREE-MUTATION OF RIO OSO GEM VARIETY

David A. Diebold, Kelso, Mo., assignor to Stark Brothers Nurseries & Orchards Company, Louisiana, Mo.

Filed Dec. 17, 1976, Ser. No. 751,727
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—43 1 Claim

1. A new and distinct variety of peach tree, which originated as a whole tree mutation of the Rio Oso Gem variety substantially as illustrated and described, which bears fruit which ripens approximately 17 to 18 days earlier than that of the Rio Oso Gem variety and approximately 8 days earlier than that of the Early Rio Oso Gem variety.

4,172
ROSE PLANT—VOLARE VARIETY

Gayle Kent McDaniel, Carlton, Oreg., assignor to Carlton Rose Nurseries, Inc., Carlton, Oreg.

Filed Jan. 14, 1977, Ser. No. 759,542
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the Hybrid Tea Class obtained as a seedling from unnamed seed parent No. 2573-V-69 and unnamed pollen parent No. 44-E-66 characterized by its ability to yield small to medium-sized long lasting blooms on a continuous basis in a greenhouse substantially as shown and described.

4,173
ROSE PLANT-CHARISMA VARIETY

Robert G. Jelly, Richmond, Ind., assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jan. 18, 1977, Ser. No. 760,412
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—22 1 Claim

1. A new and distinct variety of rose plant of the Floribunda class substantially as herein shown and described, characterized particularly as to novelty by a unique combination of vibrant multicolor bloom, vigorous habit of growth, excellent foliage having resistance to mildew and blackspot, ability to withstand moderate sub-zero temperatures, and an ability for its cut flowers to last twelve to fifteen days at room temperature indoors.

of the cylinder, means for applying a rotary drive to the piston [rod] *shaft* and a cam arrangement for causing reciprocation of the piston [rod] *shaft* as it rotates, the arrangement of ports and valve means being such that as the piston rotates and reciprocates air is induced into the chamber, is compressed in the chamber and then exhausted from the chamber, ... axially balancing the piston shaft comprising support means, and means for mounting said cylinder on said support means so that said cylinder has free axial movement on said support means.

Re. 29,505

ELECTRIC CONTROL DEVICE FOR A CAMERA

Hiroshi Aizawa, Machida, and Mitsutoshi Ozaki, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 3,812,510, dated May 21, 1974, Ser. No. ... Application for reissue Mar. 6, 1975, Ser. No. 555,758

Claims priority, application Japan, Dec. 26, 1972, 47-1087

Int. Cl.[2] G03B 7/00, 9/70

U.S. Cl. 354—... 12 Claims

PATENTS

GRANTED DECEMBER 27, 1977

ERRATA

For CLASS	See PATENT NO.
073–660	4,064,704
134–015	4,064,884
180–155	4,064,967
366–348	4,065,105
366–076	4,065,106
366–343	4,065,107
366–076	4,065,108
062–510	4,065,279
134–167 R	4,065,325
250–445	4,065,397
424–248.56	4,065,453
560–059	4,065,489
560–204	4,065,490
428–522	4,065,624
428–596	4,065,625
428–629	4,065,626
364–464	4,065,661
364–464	4,065,663
364–487	4,065,665
364–759	4,065,666
362–217	4,065,667
363–019	4,065,713
365–049	4,065,756
365–244	4,065,757

PATENTS

GRANTED DECEMBER 27, 1977

GENERAL AND MECHANICAL

4,064,562

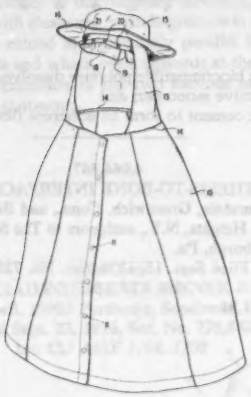
INTEGRAL RAIN CAPE AND HAT

Bernice S. Kenny, 183 Eglantine Lane, Fort Myers Beach, Fla. 33931

Continuation-in-part of Ser. No. 607,589, Oct. 20, 1975, abandoned. This application Nov. 10, 1976, Ser. No. 740,742

Int. Cl.[2] A41D *9/00*

U.S. Cl. 2—84 **3 Claims**



1. A garment comprising a cape body, a neck section attached to and rising from the cape body and having a frontal opening, a hat section attached to the top of the neck section, a retaining skirt-like element attached to the hat section interiorly of both the hat section and the neck section, the hat section having a crown portion receiving, surrounding and at least partly enclosing the neck section and the skirt-like element when the latter are extended below the hat section, a first set of fastener components on the interior of the hat section, and a cooperating set of fastener components on the skirt-like element, whereby the entire cape body and neck section can be rolled into a compact form inside of the hat section and retained therein by engaging the fastener components of the skirt-like element with the fastener components of the hat section, the rolled cape body and neck section then being enclosed and held between the hat section and retaining skirt-like element.

4,064,563

BILLIARD GLOVE

Alvin R. Stokes, 700 N. Zimmer, Pampa, Tex. 79065

Continuation of Ser. No. 557,907, March 13, 1975, abandoned. This application Aug. 9, 1976, Ser. No. 712,517

Int. Cl.[2] A41D *19/00*

U.S. Cl. 2—161 A **4 Claims**

1. A billiard glove comprising, in operative combination

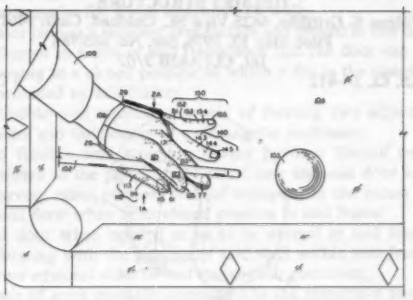
a. a plurality of dimensionally stable flexible palmar panel portions and a plurality of dorsal smooth surfaced flexible panel portions and an ulnar elastic panel portion forming, together, a hand enclosing and covering array of panel portions, and

b. distally extending from said hand enclosing array of panel portions a plurality of finger enclosing dorsal and palmar smooth surfaced dimensionally stable flexible panel portions, one of which plurality of finger enclosing panel portions form a covering for a player's thumb, another part of which finger enclosing dorsal and palmar panel portions comprises an array of dorsal and palmar finger covering panel portions for a player's index finger and another part of which finger enclosing distal dorsal and palmar panel portions comprises an array of dorsal and palmar smooth surfaced panel portions forming a covering for a player's middle finger and having an ulnar edge,

c. said glove providing an orifice between said ulnar elastic panel and said ulnar edge of said covering for said middle finger to thereby expose the fingers of a player's hand,

d. the dorsal portion of said hand enclosing array of panel portions being continuous with the dorsal portion of each of said finger covering panel portions and the palmar portions of said hand enclosing array of panel portions being continuous with the palmar portions of the finger covering panel portions, and wherein

b.1. said panel portions for the player's index finger comprise a dorsal panel portion and a palmar panel portion which are continuous with each other along the medial side of



said panel portions for the index finger and which are provided with a seam therebetween on the dorsal side of said index finger covering panel portions, and

b.2. said panel portions for the middle finger comprises a panel which extends distally from a palmar hand portion thereof and has a dorsal distal portion and a palmar distal portion continuous with each other at the medial edge thereof and joins a seam spaced away dorsally from said medial edge, and

b.3. said panel portions for a player's thumb comprises a panel which extends distally from said hand enclosing array of panels and comprises a distal dorsal portion and a distal thumb palmar portion continuous with each other along their ulnar edge and joins a seam dorsally spaced away from said ulnar edge and joined to a dorsal thumb covering panel portion.

4,064,564

CHITIN DERIVED SURGICAL GLOVE POWDER

Donald James Casey, Ridgefield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 3, 1976, Ser. No. 738,200

Int. Cl.[2] A61B *19/04;* **A41D** *19/00*

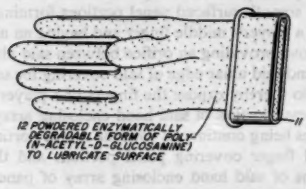
U.S. Cl. 2—168 **6 Claims**

1. A surgical glove of natural or synthetic rubber having on the surface thereof in a small but lubricity imparting quantity

a finely divided biodegradable powder consisting essentially of

an enzymatically degradable form of poly(N-acetyl-D-glucosamine) selected from the group consisting of poly[N-acetyl-6-O-(carboxymethyl)-D-glucosamine],

poly[N-acetyl-6-O-(2'-hydroxyethyl)-D-glucosamine], poly[N-acetyl-6-O-(ethyl)-D-glucosamine], and poly(N-acetyl-D-glucosamine) itself



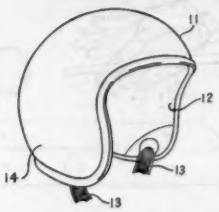
which form of poly(N-acetyl-D-glucosamine) is slowly enzymatically degraded by contact with body tissues.

4,064,565

HELMET STRUCTURE

William S. Griffiths, 4425 View St., Oakland, Calif. 94611

Filed May 13, 1976, Ser. No. 685,786
Int. Cl.[2] A42B *3/02*
U.S. Cl. 2—412 5 Claims



1. An improved helmet structure comprising a limitedly flexible outer shell having the shape of the head of a person and adapted for deflection adjacent the opening therein so as to fit over the head of a person, a conformal layer of a slowly conforming thermoplastic or pressure deformable material within said shell disposed on a substantial area of the interior surface of said shell for conforming to the physical configuration of the skull of a wearer of the helmet in physical engagement with a substantial portion of such skull, an impact absorbing layer disposed between said shell and said conformal layer and extending over a substantial area of the interior of said shell and a transfer layer of substantially incompressible fluid or gel disposed between said impact absorbing layer and said conformal layer and having a thin semirigid liner adjacent said impact absorbing layer for applying a substantially uniform pressure over the surface of said conformal layer upon the application of a force to the transfer layer from said energy absorbing layer.

4,064,566

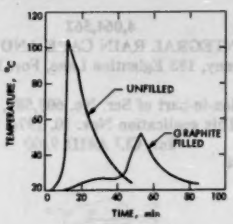
METHOD OF ADHERING BONE TO A RIGID SUBSTRATE USING A GRAPHITE FIBER REINFORCED BONE CEMENT

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Albert C. Knoell, La Crescenta, and Hugh G. Maxwell, La Canada, both of Calif.

Filed Apr. 6, 1976, Ser. No. 674,194
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.9 7 Claims

1. A method of adhering bone to the surface of a rigid substrate comprising the steps of:

applying to the bone and surface a surgical bone cement composition comprising a dispersion of 2 to 12% by weight of high modulus graphite fibers having a diameter from 1 to 50 microns and a length from 0.1 mm to 15 mm



within a biocompatible polymer dissolved in a biocompatible reactive monomer; and

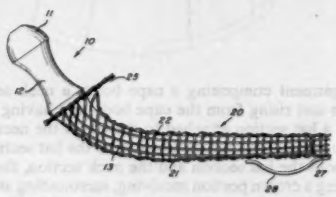
curing the cement to form an adherent flexural bond.

4,064,567

PROSTHESIS-TO-BONE INTERFACE SYSTEM

Albert H. Burstein, Greenwich, Conn., and Bertram L. Koslin, Yorktown Heights, N.Y., assignors to The Sampson Corporation, Pittsburgh, Pa.

Filed Sept. 15, 1976, Ser. No. 723,615
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 13 Claims



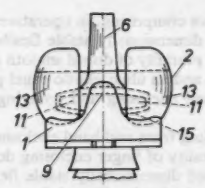
1. A prosthesis-to-bone interface comprising a sheath formed of a single thickness of a relatively rigid, malleable and intersticiated material, generally conforming in shape and adapted to receive the stem of a prosthesis therein, and means for spacing the inner wall of said sheath from said stem to define a space within which bone cement may be received.

4,064,568

KNEE-JOINT ENDOPROSTHESES

Hans Grundei, and Wolfram Thomas, both of Lubeck, Germany, assignors to Sanitatshaus Schuutt & Grundei, Lubeck, Germany

Filed Nov. 8, 1976, Ser. No. 739,819
Claims priority, application Germany, Nov. 6, 1975, 2549819
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.911 6 Claims



1. In a knee-joint endoprosthesis, consisting of a lower tibia section to be anchored in the shin-bone by a lower shank, which section has, on either side of a central ridge which extends from front to rear, a bearing face which rises in a curve

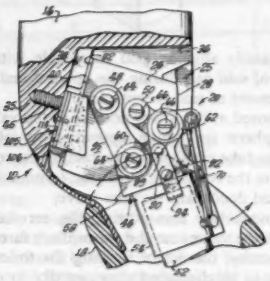
towards the front and which is hollowed-out in cross-section, and of a femur section which is to be anchored in the thigh-bone by an upper shank and which is provided with two pads which are yoked together across the ridge and are supported on the bearing faces, the improvement which consists in that a saddle-shaped ridge is provided with a fixed guiding cross-shaft which forms a free spigot on either side of said ridge and which lies off and to the rear of the centre axis of said lower shank when the joint is in the extended position, in that said two curved, hollowed-out bearing faces, and said supporting pads, which conform to said bearing faces in the extended position, diminish in width from front to rear as a result of said ridge becoming wider in the rearward direction, in that said spigots engage with clearance in guide grooves in said supporting pads which extend approximately parallel to the lower faces of said pads and which open upwards at their rear ends, and in that the extension of the two sections of the joint is restricted by an abutment.

4,064,569

ARTIFICIAL POLYCENTRIC KNEE JOINT

Harry E. Campbell, 15902 Parthenia, Sepulveda, Calif. 91343

Filed Sept. 23, 1976, Ser. No. 725,862
Int. Cl.[2] A61F *1/04, 1/08*
U.S. Cl. 3—26 **10 Claims**



1. An artificial polycentric knee-joint mechanism interconnecting an upper stump-receiving socket member and a lower swingable shank member defining a prosthetic leg member, wherein the knee joint comprises:

a substantially stationary mounting block secured to the upper socket member, forming a transverse link member;

a support carriage secured to the lower shank member, defining a second link member;

pivot means interconnecting said mounting block to said support carriage comprising:

a first substantially vertical linkage bar positioned forward on said block and said carriage;

a second substantially vertical linkage bar juxtapositioned aft of said first linkage bar, allowing geniculation between the stump receiving socket and the swingable shank member;

biasing means connected between said second linkage bar and said support carriage;

braking means supported in said carriage for engagement with said mounting block, whereby the swing action of the shank member is controlled thereby; and

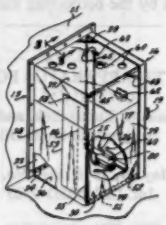
shock absorbing means arranged to engage said first linkage bar when said shank member swingably returns to a fully extended position.

4,064,570

COMPACT SHOWER STRUCTURE

Sunyong P. Kim, 3805 S. Norton Ave., Los Angeles, Calif. 90008

Filed Apr. 26, 1976, Ser. No. 680,422
Int. Cl.[2] A47K *3/23*
U.S. Cl. 4—147 **5 Claims**



1. A compact shower structure comprising:

a rectangular flat frame attached to a wall;

a door having a recessed rear surface and hinged at one side thereof to a side of said frame such that the door can be swung to a closed position in which it fits in the opening provided by said frame;

a flexible wall structure capable of forming two adjacent sides and the bottom of a rectangular enclosure;

said flexible wall structure having portions thereof connected to the periphery of said frame and said door and having other portions thereof collapsed in the recess of said door when in its closed position in said frame;

said door when opened so as to be normal to said frame forming with the portion of said wall within said frame two adjacent sides of said rectangular enclosure;

a pair of arms pivotally connected to the respective upper and lower corners of the door which arms when disposed horizontally serve to extend the flexible wall structure to form the remaining two adjacent sides and the bottom of said rectangular enclosure; and

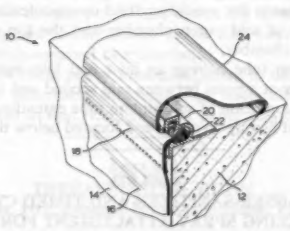
a shower head mounted in said structure.

4,064,571

POOL LINER RETAINER

Frank T. Phipps, Georgetown, Canada, assignor to Timerax Holdings Ltd., Georgetown, Canada

Filed Sept. 13, 1976, Ser. No. 722,992
Int. Cl.[2] E04H *3/16*
U.S. Cl. 4—172.19 **16 Claims**



1. A holding assembly for a pool liner retainer system, comprising:

an elongated member defining first and second U-shaped channels; the first channel being adapted to accomodate a pool liner bead and having an elongated extended portion; the second channel being located adjacent to the first channel so that the opening of the second channel faces said extended portion;

a sliding insert adapted to be slidably located in the second

channel to retractably project from the second channel toward said extended portion and said insert having a lower portion defining means whereby upon engagement of said means by a liner bead said insert retracts into said second channel; and

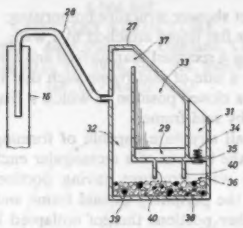
means for biasing the sliding insert toward said extended portion, so that a liner bead located in the first channel is held in position by the projecting sliding insert.

4,064,572

LEVEL ACTUATED APPARATUS FOR DELIVERING CHEMICALS

Moye Wicks, III; Hans E. Kubitschek, and William E. King, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 19, 1976, Ser. No. 687,833
Int. Cl.² E03D 9/03
U.S. Cl. 4—227 **7 Claims**



1. An apparatus for delivering measured amounts of chemical solution upon actuation of a cycling fluid level which comprises:

a. a solids chamber adapted to contain solid soluble chemicals or a mixture of solid soluble chemicals and ballast material,

b. a refill chamber having an open top end situated above the top of said solids chamber,

c. first means for providing fluid communication between said refill chamber and said solids chamber which permits fluid flow from said refill chamber into said solids chamber and which prevents reverse fluid flow from said solids chamber into said refill chamber,

d. a discharge chamber extending above the top of said solids chamber,

e. second means for providing fluid communication between said discharge chamber and said solids chamber,

f. a pump chamber having an open bottom portion and a top portion extending above the top of said solids chamber,

g. third means for providing fluid communication between the top of said pump chamber and the top of said discharge chamber,

h. a siphon tube having an inlet end into said discharge chamber at a point between said second and third means, having a portion of said siphon tube extending above the inlet and having an outlet end located below the inlet end.

4,064,573

CLEANSER-SANITIZER AND TIMED CYCLE DEODORIZING SPRAY ATTACHMENT FOR TOILETS

Joseph F. Calderone, Scottsdale, Ariz., assignor to Cahill, Sutton & Thomas, Phoenix, Ariz.

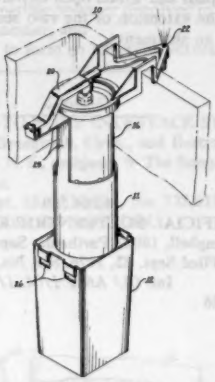
Continuation-in-part of Ser. No. 582,739, July 2, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,549
Int. Cl.² E03D 9/02
U.S. Cl. 4—227 **8 Claims**

1. In an apparatus located within the flush tank of a toilet for dispensing a measured amount of aerosol deodorant spray into the atmosphere surrounding the toilet and including: a pressurized spray can containing liquid deodorant and having a normally closed, tilt-actuated atomizing valve, a tube disposed within the can for delivering liquid deodorant to the valve, a sphere disposed within the tube and translatable thereinalong for a limited distance from a retainer through the tube to the valve; the improvement comprising in combination:

a. valve actuating means for exerting a tilting force on the valve sufficient to actuate the valve, said valve actuating means comprising

i. a receptacle displaceable upwardly and downwardly in response to changes in the water level in the flush tank;

ii. lever means coupled to said receptacle and to said valve for actuating said valve when said receptacle moves downwardly and for converting the force derived from the downward movement of said receptacle to a tilting force for actuating the valve, said lever means including guide means in contact with the outer surface of the can



for vertically aligning said receptacle with the outer surface of said can during the upward and downward displacement of said receptacle;

b. a seat disposed at the lower portion of the valve for seating the sphere and, upon upward flow of deodorant through the tube causing corresponding movement of the sphere from the retainer to said seat, terminating the flow of the liquid deodorant into the valve;

c. conduit means for transporting the aerosol deodorant spray from the valve into the atmosphere surrounding the toilet; whereby, the act of flushing the toilet causes the receptacle to be displaced downwardly to operate said valve actuating means and to dispense a measured amount of deodorant spray into the atmosphere surrounding the toilet.

4,064,574

STRETCHER

Alois Schnitzler, Friesdorfer Strasse 43, D-5300 Bonn, Germany

Filed Nov. 6, 1975, Ser. No. 629,395
Claims priority, application Germany, Nov. 9, 1974, 2453246; Feb. 18, 1975, 2506816; Feb. 4, 1975, 2505444; Sept. 30, 1975, 2543473
Int. Cl.² A47B 83/04
U.S. Cl. 5—82 R **23 Claims**

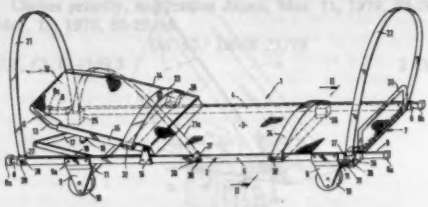
1. A stretcher having a pair of transversely-spaced, longitudinally-extending side struts with head and foot ends, each strut having an upper surface and portions therebelow, a cover surface stretched over and between said struts, and a plurality of strap means selectively extendable over said cover surface, wherein:

each of said strap means is retained at a first end thereof to one of said struts via a spring-biased rotatable shaft in a roll-up device and has a free end opposite said first end;

said roll-up device being affixed to said portions of said one strut below said upper surface thereof; and

each said rotatable shaft carries thereon a pawl wheel having

teeth means engageable by a locking lever, said lever being biased out of engagement with said pawl wheel and being selectively positioned by an attendant to said

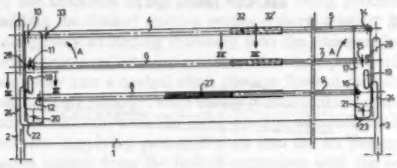


stretcher to permit and substantially prevent said wheel and shaft from rotating and to fix a strap length adjustment.

4,064,575
BED SIDE RAILING

Antonius Hermanus Sanders, Loosdrechtseweg 38, Hilversum, Netherlands

Filed Apr. 21, 1976, Ser. No. 678,882
Claims priority, application Netherlands, Feb. 19, 1976, 7601661
Int. Cl.² A47C *21/00*
U.S. Cl. 5—331 **6 Claims**



1. A side railing for a bed comprising:
a plurality of relatively overlying beams extending in the direction of length of the bed;
side supports;
pivotal shafts coupling said beams with said side supports, said pivotal shafts extending transverse to the longitudinal direction of said beams, each of said beams being formed from two telescopic, relatively slidable portions;
at least one spring disposed in said beams and tending to urge the two beam portions away from one another;
coupling members for coupling the side railing with a bed, said coupling members being provided with profiled parts adapted to grip partially around parts of a head and foot frame respectively of a bed; and
shafts parallel to said pivotal shafts for connecting one end of each of said side supports to a respective one of said coupling members, said coupling members being held in place on said head and foot frame by the action of said spring.

4,064,576
COMBINED BABY BOTTLE HOLDER AND MATTRESS COVER

Grace J. Threatt, Rte. 1 Box 17104, Colonial Heights, Va. 23834

Filed Feb. 9, 1977, Ser. No. 767,101
Int. Cl.² A47G *9/00*; A47D *15/00*
U.S. Cl. 5—334 C **3 Claims**

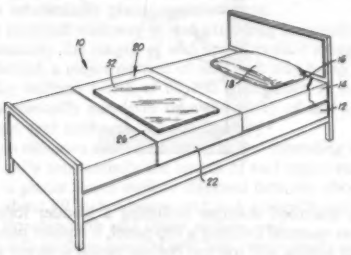
1. A holder for a baby bottle comprising a pouch-like structure adapted to snugly fit over the end section of a mattress, said holder being fabricated of soft, absorbent fabric and comprising a generally rectangular face portion, a rear portion, top portion and two opposed side portions, said face portion being provided with at least two pockets each capable of snugly accomodating a baby bottle, the openings of said pockets being spaced apart in opposed relationship about a vertical line of symmetry of said holder, each pocket containing therein a wedge member capable of elevating the bottom of a baby bottle so that the front of said bottle is angled downwardly

toward said line of symmetry, said rear portion containing tensioning means operative to draw said holder structure tightly against a mattress which may be disposed within the pouch-like interior of said holder.

4,064,577
BEDDING DRAW SHEET

Ronald D. Walters, Oklahoma City, Okla., assignor to Hygeia Corporation, Oklahoma City, Okla.

Continuation of Ser. No. 651,643, Jan. 23, 1976, Pat. No. 4,021,870. This application Nov. 24, 1976, Ser. No. 744,709
Int. Cl.² A47G *9/00*; A61G *7/06*
U.S. Cl. 5—334 R **2 Claims**



1. An improved draw sheet for bedding which comprises:
a base sheet formed of textile material;
a panel bonded to said base sheet formed of a fine weave textile material having a thread count in the range of from about 264 threads per inch to about 280 threads per inch whereby said panel, because of said fine weave has water penetration-resistant characteristics;
a water-absorbent pad positioned adjacent to said panel; and
means for removably attaching said water-absorbent pad connected to said water-resistant panel and to said pad.

4,064,578
THERAPEUTIC CUSHION

Junji Yamada, 1-11, 2-chome, Higashinihonbashi, Chuo, Tokyo, Japan

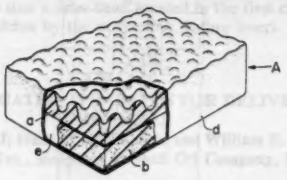
Filed Nov. 24, 1975, Ser. No. 634,510
Claims priority, application Japan, June 15, 1975, 50-75116
Int. Cl.² A47C *7/20*
U.S. Cl. 5—355 **17 Claims**

1. A therapeutic seat cushion for use with a chair which comprises:
a sponge mat layer comprising a polymeric foam including first and second surfaces;
said first surface contains a plurality of projections which extend from the first surface of the sponge mat layer;

said second surface being substantially flat; and

a slider layer comprising a fibrous material positioned adjacent to the substantially flat second surface and being readily shiftable relative to said sponge mat layer;

whereby when a force is applied to said seat cushion by a person positioned on said seat cushion, the relative positioning of the person and the sponge mat layer remains substantially constant relative to each other but shiftable relative to the slider layer thereby facilitating ready and comfortable movement of said person disposed on said seat cushion.

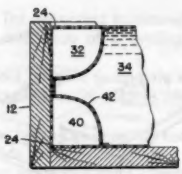


4,064,579

WATERBED MATTRESS WITH INFLATABLE MARGINS

Howard Allyn Winther, Santa Clara, Calif., assignor to Liberty Vinyl Corporation, Santa Clara, Calif.

Filed Aug. 11, 1976, Ser. No. 713,563
Int. Cl.[2] A67C *27/08*
U.S. Cl. 5—371 8 Claims



1. In a waterbed mattress including a bladder formed of pliant sheet material defining a top panel, a bottom panel, and side panels joining said top and bottom panels at upper peripheral margins and lower peripheral margins respectively, said side panels being adapted to conform to a rigid, circumscribing peripheral framework preventing lateral distortion thereof, the improvement comprising: at least one supplemental panel of a pliant sheet material which internally spans said upper peripheral margins, sealably separating said bladder into a main chamber for containing a liquid and at least one upper corner chamber for containing a selected fluid, the spanning dimension of said supplemental panel approximating the length of the hypotenuse of a triangle whose legs are formed by the portions of said top panel and said adjacent side panel forming said upper corner chamber whereby said at least one upper corner chamber establishes the structural rigidity of said upper peripheral margins.

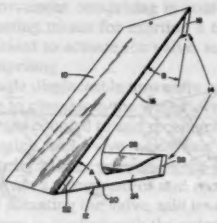
4,064,580

MULTI-POSITION MULTI-PURPOSE SUPPORT AND STORAGE STRUCTURE

Levi Ike Ezekoye, P.O. Box 8611, Pittsburgh, Pa. 15221

Filed Oct. 13, 1976, Ser. No. 731,921
Int. Cl.[2] A47C *7/02, 22/00*
U.S. Cl. 5—327 B 3 Claims

1. A multi-purpose, multi-position support structure comprising an essential planar rigid support member, first and second planar base assemblies rigid with said main support member, said first and second base assemblies being disposed at first and second different angles with respect to said main support member and adapted to provide stable support for said main support at different angles with respect to a supporting surface, said second angle being larger than said first angle and being not greater than 45° and the sum of said first and second angles being not greater than 80°.

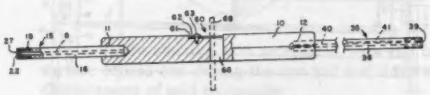


4,064,581

WIRE STRIP, WRAP AND UNWRAP TOOL

Marvin Kober, Spring Valley, N.Y., assignor to O.K. Machine and Tool Corporation, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,519
Int. Cl.[2] H02G *1/12*
U.S. Cl. 7—14.1 R 9 Claims



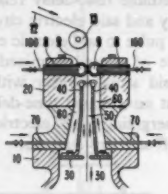
1. A tool for stripping insulation from a wire end, for making a wrapped wire connection to an electrical terminal, and for unwrapping a wrapped wire connection, comprising a handle portion, a wrapping bit extending from one end of the handle and comprising an elongated shaft provided at one end with a recessed structure including an end face having a central terminal-receiving bore and, offset and spaced from the bore, means providing a hole substantially parallel to the bore for receiving the straight wire end and further including means providing a single wall extending completely across said end face and having a wire-engaging surface extending in a plane which is substantially parallel to but offset from the shaft axis and adjacent the bore edge, an unwrapping bit extending from the opposite end of the handle and comprising an elongated shaft provided at one end with a recessed structure having a central terminal-receiving bore dimensioned to receive the bare terminal but not a wire-wrapped terminal and, adjacent said bore, structure providing a knife edge extending transversely completely across the shaft end and adapted to fit under the first wrapped wire coil and engage with a surface thereof the adjacent coil surface for unwrapping the coil upon rotation of the tool, said knife edge surface being oriented substantially parallel to the orientation of the said adjacent facing surface of the coil end, and stripper means for removing insulation from electrical wire and comprising opposed insulation-cutting edges forming a stripping slot dimensioned to receive the bare wire but cut through any insulation thereon, said handle having a through-aperture therein located between the wrapping bit and unwrapping bit, said stripper means being mounted on said handle over the through-aperture such that a wire when positioned in the stripper slot will extend through the handle aperture.

4,064,582

PRESSURE SEALING METHOD

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Japan

Filed Feb. 18, 1976, Ser. No. 658,876
Claims priority, application Japan, Mar. 11, 1975, 50-29235; Mar. 11, 1975, 50-29236
Int. Cl.² D06B *23/18*
U.S. Cl. 8—149.3 2 Claims



1. A method of pressure sealing at least one of the inlet into and outlet from the pressure chamber in a high pressure steamer in which a cloth material is processed, comprising the steps of forming a pair of oppositely disposed closed hollow structures having resilient contacting surfaces with the contacting surfaces arranged to provide one of an inlet into or outlet from the pressure chamber of the high pressure steamer, passing a cloth material between the resilient contacting surfaces of the hollow structure, supplying pressurized air into the hollow structures and adjusting the air pressure in accordance with the thickness of the cloth material being processed for providing the desired nipping pressure therebetween, forming a passageway extending inwardly into the steamer from the hollow structures into the pressure chamber, partitioning the passageway into a central cloth passage flanked on both sides by air pressure passages with the air pressure passages disposed in communication with the cloth passage adjacent the hollow structures, supplying pressurized air into the air passages at a location remote from the hollow structures with the pressure of the pressurized air supplied corresponding to the internal pressure in the pressure chamber of the high pressure steamer so that the pressurized air flows first through the air passages toward the hollow structures where it reverses direction entering into the cloth passage and then passes from the cloth passage into the pressure chamber.

4,064,583

PROCESS FOR THE CONTINUOUS WET TREATMENT OF TEXTILES IN ROPE FORM

Hans-Ulrich von der Eltz, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 20, 1976, Ser. No. 716,276
Claims priority, application Germany, Aug. 23, 1975, 2537589
Int. Cl.² D06B *3/24*
U.S. Cl. 8—149.1 5 Claims

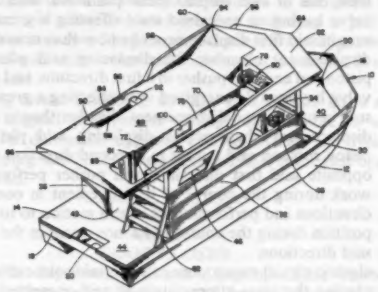
1. A process for the continuous wet treatment of a fibrous textile web in which the textile material is to be impregnated in a pressure container under high temperature conditions with a liquor containing a treating agent and thereafter the treating agent is fixed onto the fibers of the material during a dwelling operation, said process comprising the steps of impregnating said textile web in said pressure container in its open width form while in a dry state with said treating agent liquor, thereafter forming said web into a rope and further soaking the rope in the pressure container in said treating liquor; thence withdrawing said rope from said pressure chamber through at least two successive chambers through at least two successive locks, each containing a successively lower pressure than said pressure container, into a dwelling chamber under atmospheric pressure, returning said textile web from its rope form to its open width form in said dwelling chamber while fixing the treating agent on the open form web.

4,064,584

UPPER BOAT DECK

James Harold Funkhouser, 933 Avenue H, Fort Madison, Iowa 52627

Filed Sept. 13, 1976, Ser. No. 722,781
Int. Cl.² B63B *3/48*
U.S. Cl. 9—1.1 10 Claims



1. A boat having a hull, a lower deck supported on said hull, a cabin provided on said lower deck, and an upper deck disposed in a spaced generally parallel relationship with said lower deck, said upper deck projecting beyond the ends of and providing a cover for said cabin, said upper deck comprising an intergral one piece structure characterized by

A. a substantially planar upper surface,

B. a recessed walkway in and extending longitudinally substantially the length of said upper surface along one side thereof, a major portion of said walkway being of generally uniform width of no less than about 12 inches and substantially narrower than the width of said upper surface, said walkway being defined by

i. an elongate aperture formed in and extending longitudinally substantially the length of said upper surface,

ii. a planar lower surface disposed between about 12 and about 20 inches below and in a generally parallel relationship with said upper surface, and

iii. side surfaces integral with and connectively supporting said upper and lower surfaces,

C. said lower surface being shorter in length than said aperture and defining adjacent the stern end thereof rearwardly of said cabin an opening through said upper deck to provide access between said lower deck and said walkway, and

D. means provided externally of said cabin for assisting one to climb between said lower and upper decks through said access opening.

4,064,585

THREAD CUTTING MACHINE

Wilhelm Loos, Plettenberg, Germany, assignor to Loos & Schmidt Wilhelm Loos GmbH, Plettenberg, Germany

Filed Oct. 7, 1976, Ser. No. 730,520
Claims priority, application Germany, Oct. 11, 1975, 2545623
Int. Cl.² B23G *1/20, 11/00*
U.S. Cl. 10—130 WH 15 Claims

1. In an automatic thread cutter for nuts and similar mass-produced parts where the nuts or the like are taken from a magazine and moved through a feed trough into a guide where they are held secured against rotation and are then pushed by means of a pusher over a rotating thread cutter from where they are subsequently removed while the pusher is returned to its starting position, the improvement comprising:

a. a pressure medium operated double acting actuating cylin-

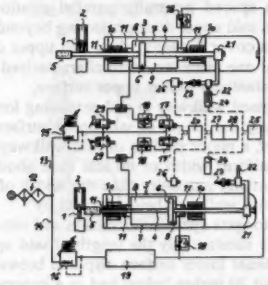
der including first and second displacement chambers and a piston separating said chambers and being slidably received therein;

b. a piston rod affixed to said piston and projecting from said cylinder and carrying said pusher;

c. a pressure medium supply means including a conduit circuit coupled to said first and second displacement chambers and pressurizing means connected in said conduit circuit for maintaining said pressure medium under pressure;

d. a solenoid valve connected in said conduit circuit for controlling the admission of the pressure medium into at least one of said displacement chambers, said solenoid valve having an energized state effecting a greater pressure in said first displacement chamber than in said second displacement chamber for displacing said piston, said piston rod and said pusher in a first direction; said solenoid valve having a de-energized state effecting a greater pressure in said second displacement chamber than in said first displacement chamber for displacing said piston, said piston rod and said pusher in a second direction which is opposite said first direction; said pusher performing its work during the course of its movement in one of said directions and performing its return motion to its starting position during the course of its movement in the other of said directions;

e. electric circuit means connected to said solenoid valve for placing the same alternatingly in said energized and de-energized states, said electric circuit including



1. a settable pulse generating means for controlling, dependent upon its setting, the length of the alternating energized and de-energized states; and

2. drive means for driving said thread cutter;

f. a first electric safety means having

1. a first control switch formed of a first stationary switching member and a first movable switching member cooperating with said first stationary switching member and attached to said piston rod for moving in unison therewith; said first control switch emitting a first pulse in response to a predetermined position of said first movable switching member relative to said first stationary switching member in the course of travel of said piston rod in its normal, predetermined path;

2. a first settable time-delay relay connected to said first control switch for receiving said first pulse from said first control switch; said first settable time-delay relay being connected to said electric circuit means for applying a second pulse to said electric circuit means solely in the absence of said first pulse within a predetermined period set at said first time-delay relay; said second pulse de-energizing said electric circuit means for switching off said drive means; and

g. a second electric safety means having

1. a second control switch formed of a second stationary switching member and a second movable switching member cooperating with said second stationary switching member and attached to said piston rod for moving in unison therewith; said second control switch emitting a third pulse in response to a predetermined position of said second movable switching member relative to said second stationary switching member in the course of travel of said piston rod beyond its normal predetermined path;

2. a storage relay operatively connected to said second control switch for receiving and counting third pulses emitted by said second control switch; and

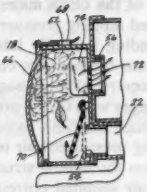
3. a second settable time-delay relay connected to said storage relay and said electric circuit means for applying a fourth pulse to said electric circuit means solely in the presence of a predetermined count of said third pulses in said storage relay within a predetermined period set at said second time-delay relay; said fourth pulse de-energizing said electric circuit means for switching off said drive means.

4,064,586

FILTER SYSTEM FOR SWIMMING POOL CLEANING MACHINES

Marshall J. Caron, Boca Raton, Fla., assignor to Florida Machine of Boca Raton, Boca Raton, Fla.

Filed Feb. 2, 1976, Ser. No. 654,568
Int. Cl.[2] E04H *3/20*
U.S. Cl. 15—1.7 **9 Claims**



1. In combination with a submergible swimming pool cleaner having a water and debris inlet and a water discharge conduit adjacent the rearward end thereof,

a debris trap having rearward, forward, upper and lower ends,

said trap having an inlet end at its lower forward end which is in communication with the water discharge conduit, said trap having an outlet end adjacent its upper forward end,

a transversely extending filter tank cover secured to said cleaner, said cover having rearward and forward sides, upper and lower ends and opposite ends, said cover having a water discharge opening formed therein which is in communication with the debris trap discharge conduit, said cover having a pair of laterally spaced discharge openings formed therein,

a pair of spaced-apart and forwardly extending filter tanks having filters positioned therein, said tanks having water inlet openings formed therein which are in communication with the tank cover water discharge opening,

said tanks having rearward discharge ends secured to the forward side of said cover which are in communication with the cover discharge openings,

water deflector means on the rearward side of said cover adjacent said discharge openings for deflecting the discharging water in an upwardly direction,

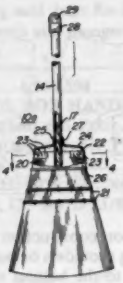
and trap means in said debris trap for preventing larger particles of debris from passing from said debris trap into said filter tanks while permitting smaller particles of debris to enter said filter tanks.

4,064,587

BROOM CONSTRUCTION

Martin Schnabl, c/o John Eppler Machine Works, Inc., 9150 State Road, Philadelphia, Pa. 19136

Filed July 6, 1976, Ser. No. 702,977
Int. Cl.[2] A46B 3/00; B25G 1/10
U.S. Cl. 15—175 4 Claims



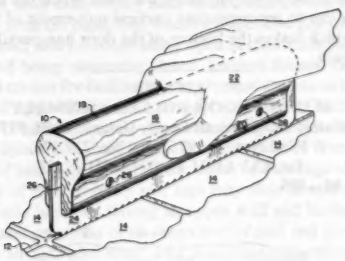
1. A broom comprising
a handle which includes
a convolute round paper tube having the turns thereof adhesively secured together,
a wooden plug adhesively held in engagement within one end of said tube for broom head attachment to the tube and plug,
a cap at the opposite end of the tube from the plug and closing said opposite end, and
a broom head secured to said tube and said plug by a fastener engaging the head and handle and extending into the plug.

4,064,588

TILE GROUT-CLEANING TOOL

Jack B. Cooper, 4312 W. Main St., Skokie, Ill. 60076

Filed Apr. 29, 1976, Ser. No. 681,704
Int. Cl.[2] A47L 13/08
U.S. Cl. 15—236 R 1 Claim



1. A hand tool for cleaning substantially straight lines of grout between rectangular tiles affixed to a wall surface, said tool comprising:
an elongate handle of generally constant dimensioned pear-shaped cross section having a larger dimension end and a smaller dimension opposite end adapted to be grasped by said larger dimension end for manually reciprocating said tool in the lengthwise direction, said opposite end having a longitudinal slot extending at least halfway through said handle and extending the entire length thereof and opening to the marginal edge of said opposite end to bifurcate the same, a pair of holes extending transversely through said smaller dimension opposite end, spaced apart one toward each side end of said handle;
blade means having fine teeth along one edge thereof for reciprocating along the length of said edge in said lines of grout to clean said grout, said blade means is a thin rigid substantially rectangular member secured in said slot with said teeth protruding from said slot along substantially the entire length of said slot, approximately three-fourths of the depth of said member positioned in said slot, said edge having said teeth is substantially straight and said member protrudes from each side end of said handle, said teeth being selectively spaced and dimensioned and having a gauge selected to allow said teeth and member to be engaged along the length thereof with said lines of grout between said tiles to remove grout particles of fine mesh size for cleaning the lines of grout when said tool is reciprocated without impairing the function of the grout between said tiles, and said member including a pair of perforations spaced apart such that each one aligns with one of said holes when said blade means is inserted in said slot; and
securing means extending through each of said holes and said aligned perforations through said handle in said smaller dimension opposite end removably and rigidly clamping said blade means between said bifurcated opposite end.

4,064,589

DOOR CLOSER

Thomas M. Bejarano, Hacienda Heights, Calif.; Herbert Schmidt, Sauerlandst, Germany, and Joseph J. Schmidt, Torrance, Calif., assignors to Builders Brass Works, Los Angeles, Calif.

Filed Mar. 18, 1976, Ser. No. 668,228
Int. Cl.[2] E05F 3/22
U.S. Cl. 16—53 19 Claims

1. A door closer comprising a housing, a spindle member rotatably mounted in said housing for securing said closer to a door, a cylinder formed interiorly of said housing, a piston operable in said housing, means interconnecting said piston and said spindle member for movement of said piston upon rotation of said spindle member, and means for independently regulating the rate of closing and back checking the opening and latching of the door, said means including a plurality of valve means communicating with said cylinder for permitting a restricted flow of fluid about said piston as said piston reciprocates within said cylinder in response to the opening and closing of said door and means corresponding to the positioning of said piston within said cylinder for varying said restricted flow to correspondingly vary the rate of travel of said piston, said restricted flow varying means being operable at both ends of said cylinder and therebetween.

4,064,590

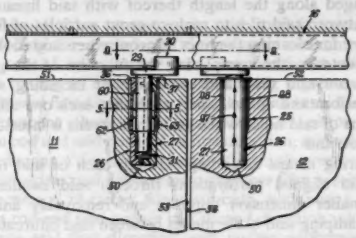
TOP GUIDE PIVOT FOR BIFOLD DOORS

Lester L. Smith, 5151 Mission Hill Drive, Tucson, Ariz.

Filed July 2, 1976, Ser. No. 702,225
Int. Cl.[2] E05D 13/02
U.S. Cl. 16—90 6 Claims

1. In a bifolding door installation having a pair of rectangular shaped door panels hingedly interjoined at adjacently opposed first lateral edges thereof and vertically mounted in a door opening for horizontal folding movements thereacross, a first panel thereof being supported adjacent its second lateral edge for pivotal movement about a vertical axis and the second panel thereof being guided adjacent its second lateral edge for movement along an elongated guide track mounted across the

upper end of the door opening and characterized by a channel opening along the underside thereof, a top guide assembly for coupling the second panel to the guide track comprising: a generally cylindrical housing insertable in a mounting socket therefor extending inwardly of the top edge of the second panel and adjacently parallel with the second lateral edge thereof, a plunger extending axially outwardly of one end of said housing, a platform portion affixed to and extending laterally from the outer end of said plunger, and track engagable



guide means projecting from said platform portion in spaced parallelism with said plunger and housing; the assembly being operationally associated with said second panel to maintain said guide means substantially opposite the intersection of said top and second lateral edges thereof and oriented for entry into the channel opening of the guide track whereby to maintain said second lateral edge of said second panel aligned beneath said channel opening throughout opening and closing movements of the pair of panels.

4,064,591

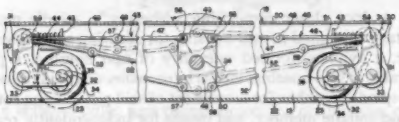
LIFTING MECHANISM FOR SLIDING DOORS

John W. Hutchison, Crown Point, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Division of Ser. No. 599,791, July 28, 1975, Pat. No. 3,988,801. This application July 9, 1976, Ser. No. 703,861

Int. Cl.[2] E05D *13/00*

U.S. Cl. 16—99 **6 Claims**



1. A sliding door including a vertical door panel, a track positioned below said door for slideably supporting the same, the improvement of a door lifting mechanism comprising;

a pair of bell crank levers each including a horizontally disposed arm and a vertically disposed arm,

means pivotally supporting said bell crank levers on said panel in horizontally spaced relation,

a roller journalled on each of said horizontal arms,

a shaft rotatably supported on said panel between said levers,

a pair of pull type linkage arrangements each pivotally connected to a respective vertical arm of a respective lever, each linkage arrangement having independent upper and lower sections,

each of said upper and lower link sections comprising a plurality of pivotally interconnected link portions to define a flexible link to accommodate pulling action and eliminate pushing action, and

a vertically extending rockable member connected to said shaft and having upper and lower portions connected respectively to said upper and lower sections of each of said linkage arrangements and exerting pull forces on said linkage arrangement for pivoting said bell crank levers during rotation of said shaft to pivot said rollers into and out of lifting engagement relative to said track.

4,064,592

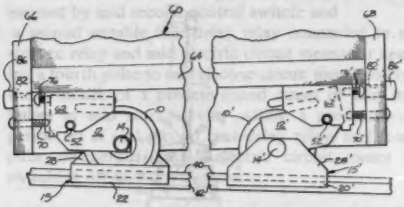
RETAINER FOR SLIDING DOORS AND THE LIKE

Harry M. Riegelman, Fullerton, and Vernon Edwin Madison, Orange, both of Calif., assignors to Rusco Industries, Inc., Fullerton, Calif.

Filed May 19, 1976, Ser. No. 688,050

Int. Cl.[2] E05D *13/02*

U.S. Cl. 16—100 **1 Claim**



1. In a sliding door construction operable along a floor mounted track having shoulders on both sides thereof, wherein a bracket is secured to the bottom of the door at each end, retainer means for each end of the door comprising:

a wheel engaging the top of the track and having an axial pin;

an elongated door clip pivotally mounted adjacent one one of its ends to said axial pin and pivotally supported at its other end by the bracket;

and a track clip including a channel substantially longer than the diameter of said wheel,

said channel having a web between parallel sides, said sides having inturned flanges,

said channel having an elongated opening in its web surrounding the portion of the wheel engaging the track,

a vertical plate extension from one of said sides, the upper edge of said extension being substantially shorter than the diameter of said wheel, said extension being pivotally mounted on said axial pin, said channel sides being spring-like to permit said flanges to be spread to straddle the track and snap into engagement with the shoulders thereof,

whereby said track clip can remain clipped to the track to keep the wheel engaging the track when the door clip pivots to accommodate vertical movement of the door which makes the bottom of the door non-parallel to the track.

4,064,593

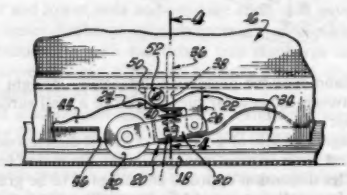
SLIDING DOOR ROLLER ASSEMBLY

B. J. Helmick, 303 Deborah Court, Upland, Calif. 91786

Filed Nov. 1, 1976, Ser. No. 737,475

Int. Cl.[2] A47H *15/00*; E05D *13/02*

U.S. Cl. 16—105 **6 Claims**



1. A supporting roller assembly for a sliding door comprising:

a mounting bracket,

a roller carrier,

a peripherally grooved roller on said carrier,

means mounting said carrier on said bracket for normally generally vertical movement of said carrier relative to said bracket,

a limit stop plunger vertically movable in said bracket and engageable with said carrier to limit upward movement of said carrier relative to said bracket,

a spring for urging said plunger toward said carrier to urge said carrier downwardly,

said bracket comprising a pair of resilient clamp arms straddling said plunger, and

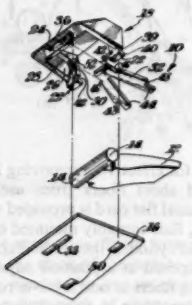
a clamp screw joining said arms for drawing said arms together to firmly clamp said plunger in fixed position relative to said bracket.

4,064,594

TOOL BOX HANDLE

Joseph A. Teti, Jr., Merion, and Peter A. Peroni, Pottstown, both of Pa., assignors to LaFrance Precision Casting Company, Philadelphia, Pa.

Filed Nov. 11, 1976, Ser. No. 740,976
Int. Cl.[2] A47B 95/02
U.S. Cl. 16—125 **41 Claims**



1. A handle for mounting on a panel of a tool box or the like comprising an elongated strap, a pair of lugs at each end of said strap, said lugs in each pair being aligned with each other and extending outwardly from each strap perpendicularly thereto, an end cover for each end of said strap, said end covers being identical with each other, each of said end covers forming a housing with the panel into which a respective pair of said lugs is captured, said housings being open at their ends facing each other and being otherwise closed, keepers formed on each of said end covers for facilitating securement thereto to the panel, a pair of opposed lug nests in opposite sides of said housing parallel to said strap, the sides of said lug nests being spaced apart a distance slightly larger than the distance from the end of one of said lugs to end of the other of said lugs of each of said pair of lugs whereby said lugs may slide in said lug nests, each of said lug nests having an upper wall and having a front wall at said open end of its respective of said end covers, said upper wall and said front wall comprising abutments in the path of inward sliding motion of said lugs to prevent further inward sliding motion of said lugs, and said end covers being of thickened construction in portions thereof in said path of inward sliding motion of said lugs to provide greater load carrying capability of said handle.

4,064,595

METAL DOOR AND HINGE CONSTRUCTION

John Y. McLeish Leaver, Quincy, Ill., assignor to The Knapheide Manufacturing Co., Quincy, Ill.

Filed Sept. 7, 1976, Ser. No. 720,646
Int. Cl.[2] E05D 5/02, 5/06
U.S. Cl. 16—128 R **4 Claims**

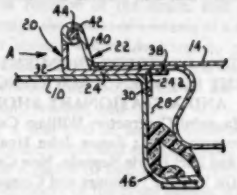
1. Combination hinge and weather shield construction for use in securing a door to a body, the latter presenting an opening to be closed by the door, and in preventing moisture and dirt from entering the opening, said construction comprising:

a first planar section adapted to be secured to said body outside of said opening and extending along the body for a distance in a direction away from said opening, said first section being characterized by a plurality of first land portions along its length;

a first barrel mounting section extending transversely away from the body and being coupled with said first planar section at the end of the latter removed from said opening;

a plurality of first hinge barrels disposed in spaced apart relationship along said first barrel mounting section;

a second planar section adapted to be secured to said door and extending outside of said opening along the body for a distance in a direction away from said opening, said second section being characterized by a plurality of second cutaway portions separated by a plurality of second



land portions, both of said second cutaway and land portions extending along said body,

said second cutaway portions and said second land portions being complemental to said first cutaway portions and said first land portions whereby said cutaway portions on one section receive the land portions of the other section;

a second barrel mounting section extending transversely away from the door and being coupled with said second planar section at the end of the latter removed from said opening;

a plurality of second hinge barrels disposed in spaced apart relationship along said second barrel mounting section; and

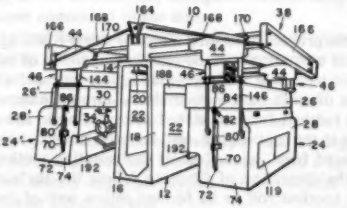
a hinge pin received by said first and second hinge barrels.

4,064,596

APPARATUS FOR PROCESSING POULTRY

Edward J. Crane, Ottumwa, Iowa, assignor to Barker International, Inc., Marietta, Ga.

Filed Mar. 3, 1976, Ser. No. 663,304
Int. Cl.[2] A22C 21/02
U.S. Cl. 17—11.1 R **22 Claims**



1. Apparatus for picking fowls as they are conveyed along a predetermined path of travel comprising:

means forming an elongated enclosure through which the fowls are conveyed during the picking operation, said enclosure being opened at the ends thereof to allow the passage of fowls therethrough and having openings formed in the sides thereof;

a pair of opposed picking assemlies positionable at the sides of said enclosure to extend into said openings, said picking assemblies each including a plurality of finger elements adapted to engage the fowls to remove the feathers therefrom;

an overhead supporting framework extending transversely to said elongated enclosure generally perpendicular to the sides thereof; and

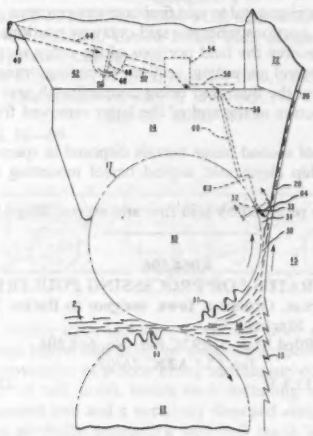
carriage means mounting said picking assemblies on said supporting framework for movement toward and away from said enclosure means, said picking assemblies when moved toward said enclosure means extending through said side openings into cooperative operative picking positions and when moved in a second position along said supporting framework providing access to the interior of said enclosure and said picking assemblies.

4,064,597

PREVENTION OF FIBERS FROM ENTERING THE PINCH POINT BETWEEN A ROTATING FEED ROLL AND A STATIONARY SHOE

Rashmikant Maganlal Contractor; William Carter Dodson, Jr., both of Wilmington, Del.; James John Hentges, Hendersonville, Tenn., and Earl Edwin Seppala, New Castle, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 14, 1976, Ser. No. 732,484
Int. Cl.[2] D04H *1/00*
U.S. Cl. 19—156.3 **8 Claims**



1. In the process of feeding a batt of staple fibers against the surface of a rotating toothed roll for dispersion of said fibers from said batt, said feeding including passing said dispersion of fibers through the point of closest clearance between said rotating toothed roll and a feed roll rotating in the opposite direction to the toothed roll, said feed roll riding in a stationary shoe spaced from the surface of said rotating toothed roll to permit the dispersion of fibers to follow the surface of said rotating toothed roll to be formed into a web of lesser area weight than that of said batt, said feed roll forming a pinch point with said shoe downstream of said point of closest clearance, the improvement comprising preventing said dispersion of fibers from following the surface of said feed roll to enter said pinch point, by contacting the surface of said feed roll with a gaseous fluid flowing out of said pinch point, the flow of gaseous fluid being of low volume so as not to disturb the uniformity of said dispersion of fibers on the surface of said rotating toothed roll.

4,064,598

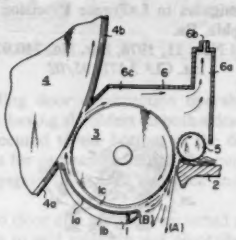
TAKER-IN-PART OF THE CONVENTIONAL FLAT CARD

Takashi Katoh, Kariya, and Susumu Otani, Aichi, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Continuation of Ser. No. 580,788, May 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 421,662, Dec. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 296,214, Oct. 10, 1972, abandoned, which is a continuation of Ser. No. 37,182, May 14, 1970, abandoned. This application Jan. 28, 1976, Ser. No. 652,992

Claims priority, application Japan, May 20, 1969, 44-46567; Oct. 22, 1969, 44-100332

Int. Cl.[2] D01G *15/40, 15/82*
U.S. Cl. 19—105 **6 Claims**



1. In the method for effectively removing impurities such as trash particles and short fibers from useful cotton fibers wherein a conventional flat card is provided with a main cylinder and a revolving flats turnably mounted on an upper cylindrical portion of said cylinder, the method comprising rotating a taker-in roller disposed at a position adjacent to said main cylinder, and feeding fibers to said taker-in roller; the improvement comprising providing a smooth unapertured taker-in undercasing at a position adjacent the underside of said taker-in rollers that a free space is formed below said taker-in roller between the position at which fibers are fed to the taker-in roller and the front edge of said taker-in undercasing, the rear edge of said taker-in undercasing extending adjacent the position where said taker-in roller most closely approaches said main cylinder, and providing a taker-in cover at a position above said taker-in roller, with the distance between said cover and said taker-in roller being substantially greater than the distance between said undercasing and said taker-in roller except in the region most closely adjacent said main cylinder, said method further comprising rotating said taker-in roller at a speed of at least 600 rpm, whereby an accompanying air stream is created at a position outside of cylindrical surface of said taker-in roller by said rotation of said taker-in roller, and the centrifugal force of said trash particles is sufficiently strong to mainly separate them from said accompanying air stream at said free space below said taker-in roller, said accompanying air stream thereby carrying primarily useful fibers and short fibers through the space between said taker-in roller and said taker-in undercasing, forming a combined airstream by said accompanying air stream of said taker-in roller with an accompanying air stream formed around said main cylinder so that said useful fibers are mainly transmitted from said accompanying air stream of said taker-in roller to said main cylinder, creating an offset air stream from said combined air stream at a position adjacent and above said position at which said taker-in roller most closely approaches said main cylinder by sucking air from between said cover and taker-in roller so that said short fibers contained in said accompanying air stream of said taker-in roller are mainly introduced into the space above said taker-in roller and consequently said short fibers are separated from said useful fibers transmitted to said main cylinder, said step of suctioning air comprising sucking air from the space above said taker-in roller so that creation of strong eddy current at a position adjacent and above said feeding position is prevented, whereby said introduced short fibers are effectively

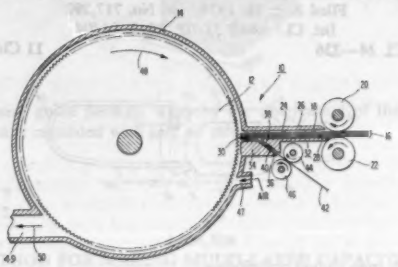
discharged from said space above said taker-in roller by said step of sucking air and further comprising the step of setting the front edge of said taker-in undercasing to be close to said taker-in roll than the rear edge thereof, whereby eddy currents are reduced and the quantity of trash particles passing in the space between said taker-in roller and taker-in undercasing is minimized.

4,064,599

FIBERIZING METHOD AND APPARATUS EMPLOYING DIFFERENTIAL FEED SYSTEM

Rudolf Neuenschwander, Swarthmore, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed June 13, 1975, Ser. No. 586,606
Int. Cl.² D01G *23/00*
U.S. Cl. 19—96 **11 Claims**



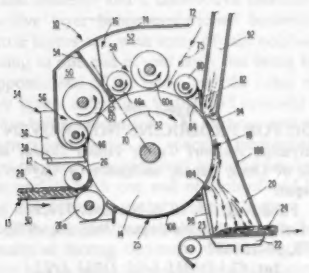
1. A method for separating fibers from a stack of fibrous sheets by directing the stack of sheets into engagement with a rotating fiberizing means; the improvement comprising the steps of directing a first stack of sheets at a first speed in a downstream direction into engagement with said fiberizing means and directing at least one additional sheet at a second speed different from said first speed into engagement with the bottom of said first stack upstream of the fiberizing means and then, as part of said stack, into engagement with said fiberizing means.

4,064,600

METHOD FOR FORMING FIBROUS STRUCTURES

Joel Peter Gotchel, Glen Mills, Pa.; Henry James Norton, Wilmington, Del., and Aris C. Spengos, Wallingford, Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Aug. 17, 1976, Ser. No. 715,138
Int. Cl.² D04H *1/00*
U.S. Cl. 19—156.3 **11 Claims**



1. A method for forming a fibrous structure from a fibrous feed that includes textile-length fibers over one-fourth inch in length, said method including the steps of:

A. rotating a drum having projections on its outer periphery;

B. directing the fibrous feed into engagement with the rotating outer periphery of the drum, whereby rotation of the drum past the fibrous feed separates fibers from said feed;

C. directing separated fibers to a release zone on the drum at which the separated fibers are released from the periphery of said drum for subsequent conveyance to a foraminous forming surface upon which the fibrous structure is formed, said separated fibers being directed to the release zone by rotation of the drum; and

D. sealing the outer periphery of the drum in a region between the fiber release zone and the section in which the fibrous feed is directed into engagement with the periphery of said drum, the sealing of said drum being carried out by;

1. directing a gas against the outer periphery of the drum with a force component in a direction opposed to the direction of rotation of the drum, said gas being directed through the outlet of a nozzle at a static pressure of at least about two atmospheres to provide a gas velocity which is sufficiently high to remove air trapped between the projections of the drum as said drum is being rotated, and

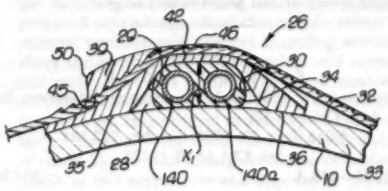
2. providing a seal pad in engagement with the outer periphery of the drum, said seal pad being spaced, in the direction of rotation of said drum, from the region on the outer periphery of the drum against which the gas is impinged, said seal pad aiding in preventing the loss of textile-length fibers from the process.

4,064,601

WELL LINE STRAP CONNECTION

Tosh Miyagishima, Simi Valley, Calif., assignor to Hydril Company, Los Angeles, Calif.

Filed Feb. 23, 1976, Ser. No. 660,440
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 PB **13 Claims**



1. In a coupling,

a. a lengthwise directionally elongated flexible strap, and

b. a keeper connected to the strap,

c. the keeper having a recess at the innerside thereof and extending through the keeper in a transverse direction relative to the length direction of the strap,

d. the keeper having a transverse cross-piece and a through socket to pass the free end of the strap, the socket defined in part by the cross-piece, the keeper also having a first ramp surface underlying the cross-piece and a crest surface outwardly exposed beyond the cross-piece in said lengthwise direction, and

e. there being means carried by the coupling proximate the socket to positively interlock the strap to the keeper in response to feeding of the strap through the socket, said interlock means including ratchet interlocking elements on the cross-piece and on the outerside of the strap,

f. the keeper having a second ramp surface, said two ramp surfaces respectively located opposite the opposite sides of the recess and said crest surface overlying the center portion of the recess.

4,064,602

WARP-KNIT SLIDE FASTENER STRINGER HALF AND METHOD OF MAKING SAME

Helmut Heimberger, Locarno, Switzerland, assignor to Optilon W. Erich Heilmann GmbH, Cham, Switzerland

Filed Sept. 30, 1976, Ser. No. 728,032
Claims priority, application Germany, Apr. 7, 1976, 2614932
Int. Cl.[2] A44B *19/00*
U.S. Cl. 24—205.1 C 11 Claims

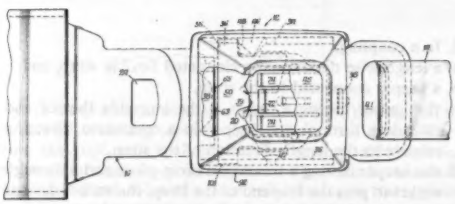
1. A slide-fastener stringer half comprising:
an elongated warp-knitted tape having a pair of opposite longitudinally extending edges and a pair of opposite faces and formed with a plurality of longitudinally extending parallel wales, said tape being knit exclusively with
a plurality of warp yarns each forming a respective longitudinally extending warp loop chain extending transversely over two respective wales with the warp loop chains each overlapping an adjacent warp loop chain at a common wale,
a first group of weft yarns laid into and each extending over three of said wales, and
a second group of weft yarns each laid into only one of said wales;
a continuous monofilamentary coupling element having a succession of turns and lying on one face of said tape along one edge thereof; and
stitching overlying said turns, extending through said tape, and having a needle thread on the other face of said tape between two of said wales at said edge.

4,064,603

SAFETY BELT BUCKLE

Louis Romanzi, Jr., Milford, Mich., assignor to Gateway Industries, Inc., Chicago, Ill.

Filed Sept. 29, 1976, Ser. No. 727,181
Int. Cl.[2] A44B *11/26*
U.S. Cl. 24—230 A 20 Claims



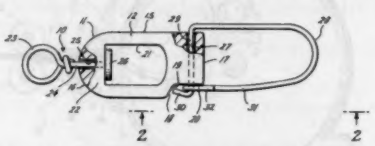
1. In a safety belt buckle having a channel-shaped buckle body having a base and a pair of upstanding walls connected to opposite sides of said base for pivotally receiving opposite pivot arms on a latch lever for pivotally mounting the latch lever for pivoting by a push-button means against the biasing force of a spring means urging the latching lever upwardly to its latching position, the improvement for reducing the height and length of the buckle body comprising pivot arm receiving openings in said upstanding sidewalls at locations at substantially the plane of the buckle base of said channel-shaped buckle body for receiving said pivot arms and for locating said pivot axis adjacent said base web, openings in said buckle base allowing portions of said latch lever to pivot downwardly into said openings when said latch lever is operated by said push button means, and a cover means attached to said channel-shaped base member and extending across said openings in said buckle base and covering the latter and said portions of said latch lever.

4,064,604

SWIVELS

George F. Hartman, 1415 Larkwood Drive, Austin, Tex. 78723

Filed Aug. 24, 1976, Ser. No. 717,290
Int. Cl.[2] A44B *13/02;* A01K *91/04*
U.S. Cl. 24—236 11 Claims



1. A snap swivel comprising
a body of thermoplastic composition including opposing broad flat faces terminating laterally in flat edges,
an opening in one end of said body,
an attaching eye having a shank portion rotatably mounted within said opening,
said shank having a head on the end thereof remote from the eye presenting a bearing surface for engagement with the body adjacent said opening,
a transversely extending bore in proximity to the rear end of said body,
a recess in the rearmost portion of one of said edges,
a clasp freely pivoted to said body,
said clasp including a transversely extending section carried in said bore and terminating outwardly in a inwardly inclined leg adapted to at least partially lie in said recess, and a resilient arm including a hook adapted to engage said leg when said clasp is turned perpendicularly upward with respect to the longitudinal axis of said body.

4,064,605

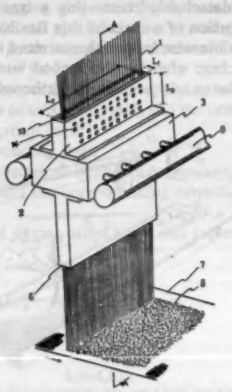
METHOD FOR PRODUCING NON-WOVEN WEBS

Takashi Akiyama; Akinori Tanji; Hideo Ikeda, and Seiichi Asano, all of Otsu, Japan, assignors to Toyobo Co., Ltd., Osaka, Japan

Filed Aug. 26, 1976, Ser. No. 717,927
Claims priority, application Japan, Aug. 28, 1975, 50-104800; Oct. 31, 1975, 50-131657
Int. Cl.[2] D04H *3/02;* D02J *1/22*
U.S. Cl. 28—103 5 Claims

1. A method for producing a non-woven web by drafting with the use of an air-jet type drafting device wherein a number of filaments which are fed from a filament source are blasted onto the face of a moving collector, said method comprising passing the filaments through a filament guide passage provided on the drafting device, said filament guide passage

having a narrow rectangular cross section and supplying air through holes or slits provided on at least one side of the



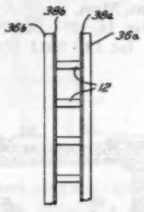
filament guide passage, whereby the distribution of the filaments is regulated with said air stream.

4,064,606

METHOD FOR MAKING MULTI-LAYER CAPACITORS

William M. Dunn, Philadelphia, Pa., assignor to TRW Inc., Cleveland, Ohio

Filed July 14, 1975, Ser. No. 595,890
Int. Cl.² H01G *4/06*
U.S. Cl. 29—25.42 **7 Claims**



1. A method of making a multi-layer capacitor comprising the steps of:

a. forming a plurality of bodies of substantially final length and width with each body having alternate layers of a dielectric material and a conductive material with each conductive layer being sandwiched between a pair of dielectric layers and with some of said conductive layers extending to one end of said body but being spaced from the opposite end of the body, and the other of said conductive layers extending to the said opposite end of the body but being spaced from the said one end of the body;

b. mounting said bodies in spaced, substantially parallel relation on a thin support sheet having a layer of adhesive on one surface with one end of each of said bodies contacting and adhering to the adhesive layer;

c. encapsulating said supported bodies in a block of dissolvable material having opposed substantially flat surfaces with the bodies being in spaced parallel relation and having their ends adjacent to said flat surfaces of said block;

d. removing the support sheet and coating the ends of said bodies with a film of a conductive metal with the films contacting the conductive layers of the body which extend to the respective ends of the body; and then

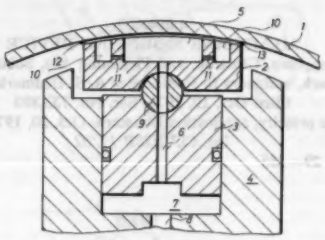
e. separating the bodies from the material of the block.

4,064,607

COMPRESSION ROLLER FOR PAPER PRODUCING MACHINERY

Robert Wolf, Herbrechtingen, Germany, assignor to J. M. Voith G.m.b.H., Heidenheim (Brenz), Germany

Continuation of Ser. No. 648,770, Jan. 13, 1976, abandoned. This application Mar. 7, 1977, Ser. No. 775,222
Claims priority, application Germany, Jan. 21, 1975, 2502161
Int. Cl.² B21B *13/02*
U.S. Cl. 29—116 AD **4 Claims**



1. A compression roller, comprising:

A. a casing defined by a hollow, rotatable, substantially circular cylinder;

B. stationary support means, disposed within said casing and including:

i. cylinder means, with an internal void;

ii. piston means, partially and slidably disposed within said internal void of said cylinder means and forming therewith a pressure chamber and extending substantially over the entire length of said casing; and

iii. a support bar, carried pivotably on said piston means and extending substantially over the entire length of said casing, having an external contour substantially conforming to the inside contour of said casing, and urged by said piston under pressure against said casing, the improvement comprising said support bar being provided with a longitudinal channel-like recess in said external contour, said channel extending substantially along the entire length of said casing, said support bar and said piston also including pressure conduits, for providing substantially unrestricted fluid communication between said channel and said pressure chamber; said support bar being further provided with a plurality of recess-like pockets arranged seriatim over the entire length of said support bar and disposed in the external surface thereof on both lateral sides of said channel, and with capillary channels for providing fluid communication between said channel and each of said pockets.

4,064,608

COMPOSITE CAST IRON DRIER ROLL

Frederick T. Jaeger, Rosemere, Canada, assignor to Eutectic Corporation, Flushing, N.Y.

Filed Sept. 30, 1976, Ser. No. 728,077
Int. Cl.² B32B *15/18*
U.S. Cl. 29—132 **11 Claims**

1. A composite drier roll having a cylindrical ferrous metal surface with a primary hardfacing alloy coating mechanically and metallurgically bonded thereto,

said ferrous metal substrate having a thermal conductivity relative to silver taken as 1 as substantially ambient temperature of at least about 0.06 calories/ sq.cm/cm/° C/sec,

said primary alloy coating being a flame sprayed heat, corrosion and wear resistant iron-group metal-base alloy having a thickness ranging from about 0.01 to 0.15 inch,

said hardfacing alloy consisting essentially of a total of up to about 30% by weight of a strong boride and carbide-

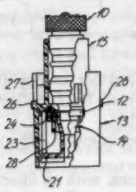
forming solute metal in amounts ranging from about 5% to 25% Cr, 0 to about 15% Mo, 0 to about 15% W, up to about 3% C, about 0.5% to 5% B, about 0.5% to 6% Si and the balance essentially said iron-group metal, the amount of boron or carbon present in said alloy being sufficient to combine with a substantial amount of said refractory metal to provide a mechanically and metallurgically bonded alloy coating having a thermal conductivity at substantially ambient temperature relative to silver taken as 1 of at least about 0.05 calories/sq.cm/cm° C.sec.

4,064,609

MEMBRANE MOUNTING DEVICE

Borge Jeppesen, Glostrup, and Flemming Aas, Soborg, both of Denmark, assignors to Radiometer A/S, Denmark

Filed Oct. 19, 1976, Ser. No. 733,893
Claims priority, application Denmark, Oct. 20, 1975, 4709/75
Int. Cl.² B23P *19/02*
U.S. Cl. 29—235 **6 Claims**



1. A mounting device for mounting a membrane or a foil in a stretched condition at one end of a rod-shaped or tubular member, such as a measuring electrode member, said mounting device comprising

a body member defining a passage therein and having first and second abutment surfaces at opposite first and second ends of said passage, respectively,

a membrane or foil arranged at said first end of the passage and extending transversely in relation thereto, said membrane being releasably retained at its rim portion,

a ring-stretching means including a radially enlarged part which is positioned at said second end of the passage and which may engage with said second abutment surface, and a part extending axially from said enlarged part through said passage, said ring-stretching means being axially displaceable in relation to said body member, and

a separate resilient mounting ring surrounding the axially extending part of said stretching means and positioned at said first end of the passage, the outer diameter of said ring exceeding the minimum diameter of the adjacent first end of said passage, whereby said ring may engage with said first abutment surface.

4,064,610

METHOD OF AND MEANS FOR FORMING FLORAL PUFFS

Julian W. Murray, 1323 Berkley, Dallas, Tex. 75224

Filed Sept. 23, 1976, Ser. No. 725,997
Int. Cl.² A41G *1/02*; B25B *25/00*
U.S. Cl. 29—243.5 **5 Claims**

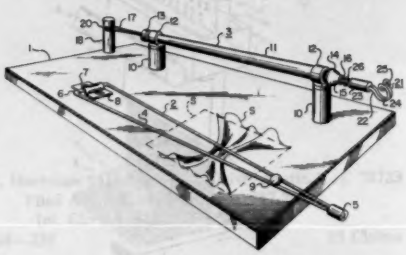
1. Means for forming a puff for a floral arrangement from a flat sheet of relatively thin flexible fine mesh fabric gathered transversely at its medial portion into fluffy butterfly shape and adapted to be secured by a flexible wire of relatively small gauge looped around the gathered medial portion of the sheet and then twisted upon itself comprising

an elongate member slidably mounted for axial reciprocation,

means for imparting rotation to the elongate slidably mounted member upon relative reciprocation thereof,

means for maintaining said member in an inward retracted position and biasing said member against outward reciprocation, and

means for detachably connecting a transversely gathered medial portion of a sheet of thin flexible fine mesh fabric and a flexible wire looped therearound to the outer end of said member, whereby the looped wire is twisted upon itself to fasten said wire to the gathered sheet by rotation



with said member when the latter is reciprocated outwardly by gripping and pulling said looped wire connected thereto outwardly,

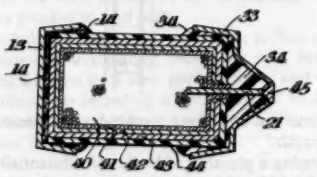
the detachable connecting means including a flexible hook having sufficient resiliency to permit separation of the fastened wire and gathered sheet therefrom upon continued outward pulling of said wire and sheet after termination of the outward reciprocation of said member.

4,064,611

METHOD FOR TERMINATING SOLID ELECTROLYTE CAPACITORS

Theodore M. Sobozenski, Concord, N.H., and Raymond E. Stupak, Pittsfield, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jan. 14, 1977, Ser. No. 759,305
Int. Cl.² B01J *17/00*
U.S. Cl. 29—270 **17 Claims**



1. A method for terminating solid electrolyte capacitors including providing a plurality of solid electrolyte capacitor bodies each of said bodies having an anode wire extending from an anode end thereof, and applying an insulating coating over said anode end and the adjacent sides of said each body so that the cathode counterelectrode is exposed at the opposite and namely the cathode end of said each body, wherein the improvement comprises:

a. forming a plurality of rectangular cups of a thin metal, each of said cups having four sides and a bottom;

b. pressing a first group of said metal cups into interference fitting rectangular holes, respectively, provided therefor in a first jigging strip, said holes being in a row and spaced therein at predetermined intervals and at predetermined orientations;

c. pushing each of said cathode ends into one of said first group cups, respectively, after applying a conductive resin beween each of said cathode ends and the corresponding of said cups;

d. curing said conductive resin;

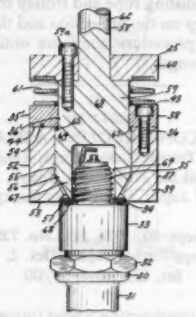
e. pressing a second group of said cups into interference fitting rectangular holes, respectively, provided therefor in a second jigging strip, said holes in said second strip being in a row and spaced therein at said predetermined intervals and predetermined orientations;
f. pushing each of said anode ends into one of said second group cups, respectively, after applying a bonding resin between each of said anode ends and the corresponding of said second group cups;
g. curing said bonding resin;
h. making an electrical connection between each of said anode wires and the corresponding of said second group cups; and
i. removing said jigging strips from said capacitor bodies.

4,064,612

LOCKING TYPE GASKET FOR SPARK PLUGS HAVING FULLY THREADED SHANKS AND TOOL THEREFOR

Harold P. Hopp, 35 Industrial Road, Lodi, N.J. 07644

Filed Oct. 26, 1976, Ser. No. 735,600
Int. Cl.² B25B *27/14*
U.S. Cl. 29—278 2 Claims



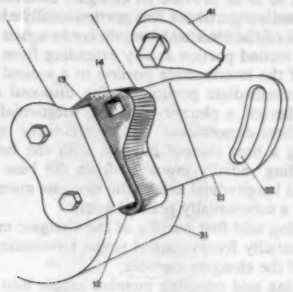
1. In a combination spark plug and captive gasket therefore, in which said spark plug includes a plug body having a threaded shank extending outwardly therefrom, said threaded shank having threads thereon extending substantially the entire lenght of said shank, said gasket including a plurality of mutually compressible sealing flanges and a locking flange extending inwardly of said sealing flanges, said threaded shank having a given pitch and defining a continuous spiral recess between adjacent convolusions of said thread, the improvement comprising: said locking flange including a plurality of locking tabs, each tab including a main body portion lying inwardly of said sealing flanges, and generally longitudinally oriented with respect to the principal axis of said threaded shank, and a transversely extending portion interconnecting said longitudinally extending main body portion to one of said sealing flanges; said tabs having an effective length along said longitudinal axis substantially equal to the combined thickness of said sealing flanges in compressed condition, and being disposed within the area encompassed by said plurality of sealing flanges, whereby said longitudinally extending portions and sealing flanges define an arcuately-shaped interstice for the insertion of a staking tool therein; said locking tabs, in installed condition overlying portions of said thread, and being deformed to a degree wherein the radially inward surfaces thereof at least partially conform to the configuration of said thread.

4,064,613

POWER STEERING PUMP BRACKET TOOL

John E. Simms, Kingsville, Md., assignor to Design & Funding, Inc., Baltimore, Md.

Filed Apr. 4, 1977, Ser. No. 784,358
Int. Cl.² B25B *23/00*
U.S. Cl. 29—407 4 Claims



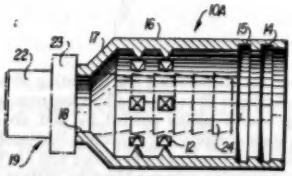
1. A tool, comprising:
a rigid body member having a flat bottom and a raised section at one end of the top of said body member; said raised section including a square opening with the bore axis perpendicular to the side plane of said rigid body member and dimensioned to accept the driving end fitting of a socket wrench tool handle;
an end stop descending from the raised section end of said body member and forming an interior 90° angle with said flat bottom; and
a 180° curved lip section on the end of said body member opposite said end stop and raised section adapted to form a U shaped channel on the bottom side of said body member with the opening facing said end stop.

4,064,614

METHOD OF MAKING AN IMPROVED HOSE AND TUBE COUPLING

Louis T. Horvath, Solon, Ohio, assignor to Samuel Moore and Company, Aurora, Ohio

Filed Dec. 23, 1976, Ser. No. 753,897
Int. Cl.² B23P *17/00*
U.S. Cl. 29—417 21 Claims



1. In a method of making an improved permanently attachable coupling member for the end of a hose or tube for use in the conveyance of fluids under pressure, said coupling member comprising a body member comprised of a coupling attachment means end, a nipple extending from said attachment means end, an external annular protruding member and external recessed securement means disposed intermediate said attachment means end and said nipple, a shell member disposed concentrically about the nipple and secured at one end thereof to the body member, the method including the steps of:
a. Forming a plurality of longitudinally extending circumferentially spaced ribs on the inner wall of an elongate mem-

ber having a longitudinal central axis therethrough, said ribs extending inwardly towards the said central longitudinal axis from a base thereof integral with the inner wall of the said elongate member;

b. Providing a length of the elongate member suitable for use as a shell for the coupling member;

c. Inserting a shaped forming tool into the formed elongate member and removing a portion of the ribs by rotational means so as to provide an elongate member defining an intermediate portion, a first portion axially extending from an end of the intermediate portion to a first end thereof, and a second portion axially extending from the opposite end of the intermediate portion to a second end thereof, said intermediate portion having disposed on the inner wall thereof, a plurality of solid, substantially symmetrical, three-dimensional circumferentially spaced barbs having a base thereof integral with the inner wall and extending radially inwardly from the base towards the central longitudinal axis of the elongate member and ending in a substantially pointed apex;

d. Forming said first portion of the elongate member into a substantially frusto-conical shape terminating at the first end of the elongate member;

e. Inserting said coupling member nipple into the elongate member from the first end thereof so that the elongate member is disposed concentrically about the nipple and said first end is axially aligned radially outwardly from the coupling body member securement means; and

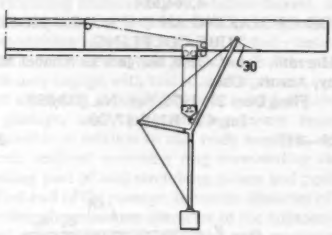
f. Compressing said first end into the coupling body member securement means to provide a shell in secured relationship therewith.

4,064,615

METHOD AND DEVICE FOR DISMOUNTING OR MOUNTING JIB SECTIONS ON A TOWER CRANE

Rickard Andersson, Vasteras, Sweden, assignor to Linden-Alimak AB, Vasteras, Sweden

Filed Oct. 28, 1976, Ser. No. 736,458
Int. Cl.[2] B23P *19/00, 11/00*
U.S. Cl. 29—426 **11 Claims**



1. A method for dismounting and mounting jib sections on a tower crane having a jib, a hook, a hoisting rope and a trolley rope passing over a pulley carried by said jib section, the dismounting steps comprising connecting said hook to a carrying cradle having a counterweight on one arm of a three-armed lever frame, connecting a sheave block on another of the frame arms and hoisting said cradle, said cradle assumes a balanced position as it is hoisted with the frame arm carrying the counterweight substantially pointing in vertical downward direction, with the frame arm carrying the sheave block and intended to carry the section to be dismounted pointing upward, hoisting said cradle until said sheave block has reached a position above the lower edge of a second jib section located adjacent to said first-named jib section, disconnecting said sheave block from said cradle and connecting same to said second jib section, lowering the cradle to the ground level, moving the hoisting rope and trolley rope from the pulley on the first-named jib section to said sheave block on said second jib section, hoisting the cradle until a short frame arm of the cradle abuts the lower side of the jib and the outer end of the frame arm is on the same level as the upper edge of the first-named jib section, connecting said another frame arm to said first-named jib section, additional hoisting of the cradle lifts the first-named jib section so that the first-named jib section can be released from said second jib section, lowering of the carrying cradle with the first-named jib section during which lowering the cradle assumes a different balanced position where the short frame arm no longer abuts the lower side of the jib, but where the outer end of the another frame arm still is above the carrying cradle arm provided with the counterweight, so that the counterweight at continued lowering first establishes contact with the ground lever, and thereafter a rotation of the carrying cradle about said counterweighted end takes place until the jib section has established contact with the ground level, and the mounting steps comprising coupling the another frame arm with the jib section to be mounted, hoisting of the carrying cradle with the jib section during which hoisting the cradle assumes a balanced position where the outer end of the another frame arm is located above the counterweight, hoisting said cradle and jib section until contact of the short frame arm with the lower side of the jib is affected whereby a rotation of the cradle about this point of contact takes place until the jib section to be mounted has arrived at the necessary level, coupling the jib section with the remaining jib, releasing the carrying cradle from the jib section and lowering same while the cradle assumes a different balanced position, at which the frame arm with the counterweight substantially points vertically downward, until the carrying cradle reaches ground level, moving the hoisting rope and trolley rope from a pulley on the jib to a pulley on the jib section and that this dismounting and mounting procedure continues until the jib has obtained the desired length.

4,064,616

METHOD FOR CONSTRUCTING A BLAST FURNACE

Katsuyuki Kubota, Tokyo; Noboru Fujii; Kouichi Yamada, both of Fukuoka; Kimikazu Nakamura, Tokyo, and Norihito Yuuki, Chiba, all of Japan, assignors to Sankyu Inc., Fukuoka, Japan

Filed Sept. 30, 1976, Ser. No. 728,373
Claims priority, application Japan, Oct. 2, 1975, 50-119613
Int. Cl.[2] E04G *21/00*
U.S. Cl. 29—429 **2 Claims**

1. A method for constructing a blast furnace comprising the steps of:

a. constructing a foundation;

b. erecting a support column assembly for supporting a blast furnace on said foundation;

c. erecting an additional tower for blast furnace erecting and dismantling purposes on said support column assembly;

d. mounting a plurality of detachable hydraulic lifting means on said additional tower;

e. constructing a carriage having a frame structure effective to serve subsequent to erection of the furnace as a part of a furnace bottom structure;

f. providing said frame structure of said carriage with grout charging conduits for charging grout into the frame structure and with cooling pipes for cooling said furnace bottom structure;

g. assembling at a site remote from said foundation a plurality of furnace assembly blocks, said assembly blocks including a furnace top block, intermediate blocks and a furnace bottom block, and having brick lining, painting, electrical instrumentation, wiring, piping and any other necessary fittings;

h. transporting said blocks in a sequential order of assembly, proceeding from said furnace top block to said furnace bottom block, from said shop onto said foundation by said carriage;

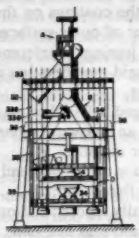
i. lifting up said furnace top block by suitable ones of said hydraulic lifting means, and then transporting the first one of said intermediate blocks onto said foundation;

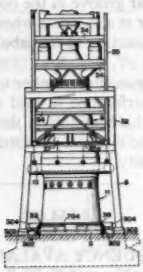
j. lifting the first one of said intermediate blocks and then joining said furnace top block with the first one of said intermediate blocks while maintaining the first one of said intermediate blocks placed on said frame structure of said carriage;

k. repeating said steps (h), (i), (j) with remaining blocks for the required number of times to lift up all the furnace blocks except the furnace bottom block by said hydraulic lifting means;

l. fixing lifting blocks on said support column assembly;

m. lifting up said furnace bottom block with said frame structure of said carriage simultaneously by suitable lifting means engaged with said frame structure of said carriage,





and joining said furnace bottom block with upper blocks lifted up;

n. setting a casting frame around said frame structure of said carriage in its lifted-up condition for the purpose of defining a casting space over the foundation;

o. charging grout into said casting space and into said frame structure of said carriage through said grout charging conduits thereby constructing a furnace bottom structure having cooling pipes therethrough;

p. disengaging said lifting means engaged with said frame structure of said carriage, removing said casting frame and said hydraulic lifting means after curing of said grout charged into the casting space.

4,064,617

DIE ASSEMBLY AND METHOD FOR CLINCHING FASTENERS TO PANELS

Daniel V. Oaks, Lindenhurst, Ill., assignor to MacLean-Fogg Lock Nut Company, Mundelein, Ill.

Filed Sept. 1, 1976, Ser. No. 719,803
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—432.1 **9 Claims**

1. A die assembly for clinching a fastener to a panel comprising:

a die body having an axially extending aperture and having a rim portion surrounding said aperture;

said die body including means in said aperture for deforming a fastener pilot driven therein;

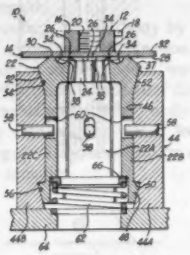
said die body being subdivided into at least two segmental parts along at least one radial plane;

a die holder having an axial opening containing said die body; and

said die holder and said die body having cooperating surfaces for camming said segments toward one another in response to axial movement of said die body in said axial opening.

9. A method of clinching a pierce nut to a panel comprising:

positioning a segmented die body behind the panel;



driving the pilot portion of the pierce nut through the panel and into an aperture in the die body;

forcing the die body segments radially inwardly during said driving step with a force derived from the driving force;

deforming the pilot with the die body during the driving step to form a clinch interconnection between the panel and the pierce nut;

pulling the panel and nut axially away from the die body; and

freeing the die body segments for radially outward movement during said pulling step.

4,064,618

METHOD OF POSITIONING AN EXPLOSIVE INSERT IN A VERTICAL TUBE

Emil P. Loch, Tampa, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

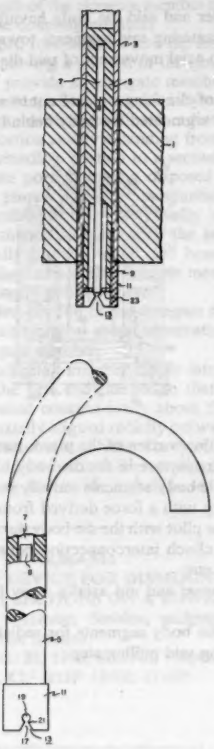
Division of Ser. No. 634,000, Nov. 20, 1975, Pat. No. 4,030,419.
This application Feb. 24, 1977, Ser. No. 771,609
Int. Cl.[2] B23P *11/02*
U.S. Cl. 29—451 **5 Claims**

1. A method of positioning a resilient insert for explosively expanding a tube into engagement with a tube sheet wherein said insert has a sleeve fixed to one end and said tube extends vertically upwardly from said tube sheet, said method comprising the steps of:

positioning an explosive cord within said insert so that when the insert is in the tube the explosive cord within the insert will have its inner end disposed adjacent the inner edge of the tube sheet,

bending the insert starting at a location beyond the inner end

of the explosive cord so that when released the insert has a bend set therein,



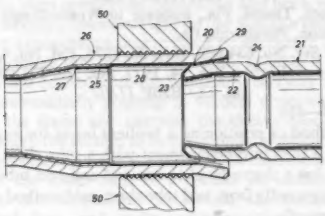
inserting the bent insert into a tube until the sleeve abuts the tube sheet, whereby the bent portion holds the insert in the vertical tube.

4,064,619

METHOD OF JOINING PLASTIC COATED PIPE

Marvin C. Echols, and David L. Gruller, both of Houston, Tex., assignors to Zap-Lok Systems International, Inc., Houston, Tex.

Filed Dec. 3, 1976, Ser. No. 747,409
Int. Cl.[2] B23P *3/00, 25/00*
U.S. Cl. 29—458 6 Claims



1. A method of joining interference fitted ends of tubular members wherein said members have a plastic coating on their interiors comprising

forming an enlarged bell end on one of said tubular members together with an outwardly flared end, so as to receive another tubular member;

coating the interior of the bell end into the section forming the enlarged bell end;

forming an inwardly tapered end on another tubular member for reception into said bell end;

coating the interior of the other tubular member as well as the end and the outer surface of the inwardly tapered end;

forming an annular groove in the outer surface of said other tubular member at a location where the groove lies within the bell upon insertion of the tubular member into the bell end;

applying an epoxy sealing member to said other member and inserting in interference fit said other member into said bell end until the coatings on the interior of the bell end and the exterior of outer surface are in close proximity.

4. A method of joining interference fitted ends of tubular members wherein said members has a plastic coating on their interiors comprising

forming an enlarged bell end on one of said tubular members together with an outwardly flared end so as to receive another tubular member;

coating the exterior of the bell end as well as the interior of the outwardly flared end;

forming an inwardly tapered end on another tubular member for reception into said bell end;

coating the exterior of the other tubular member to a location where it will align with the exterior coating on the bell end when the ends are coupled together,

forming an annular groove in the outer surface of said other tubular member at a location where the groove lies within the bell upon insertion of the tubular member into the bell end;

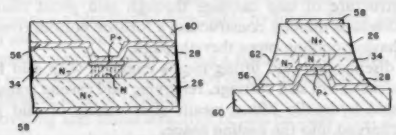
applying an epoxy sealing member to said other member and inserting in interference fit said other member into said bell end until the coatings on the interior portion of the flared end of the bell and the exterior of outer surface are in close proximity.

4,064,620

ION IMPLANTATION PROCESS FOR FABRICATING HIGH FREQUENCY AVALANCHE DEVICES

Don H. Lee, Agoura; Kenneth P. Weller, Rancho Palos Verdes; Robert S. Ying, Westminster, and William F. Thrower, Cerritos, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 27, 1976, Ser. No. 652,943
Int. Cl.[2] B01J *17/00;* H01L *21/265*
U.S. Cl. 29—580 7 Claims



1. A planar process for fabricating high frequency impact avalache transit time (IMPATT) devices having precisely controlled parasitic loss parameters and with structural characteristics which allow direct mounting into a microwave cavity, including the steps of:

a. forming a relatively thick insulating mask on the surface of a semiconductor crystal composed of a substrate of one conductivity type and a layer of said one conductivity type disposed thereon and of higher resistivity than said substrate.

b. implanting one or more ion species of said one conductivity type through an opening in said mask and into a central region of said crystal and thru said layer to thereby leave said central region of said crystal surrounded by a higher resistivity annular region

c. implanting further ion species through said opening in said mask and into said central region of said crystal to thereby form a planar PN junction terminating beneath said mask at the surface of said crystal,

d. annealing said semiconductor crystal to a predetermined elevated temperature sufficient to remove substantial amounts of ion implantation damage in said crystal and to electrically activate the ion implanted regions thereof,

e. depositing a layer of contact metalization on said insulating mask and extending into an opening thereof and into electrical contact with said central region of said semiconductor crystal,

f. bonding a heat sink to said contact metalization whereby said heat sink is in close proximity to said central region for providing a maximum of heat transfer therefrom, and portions of said contact metalization and heat sink remote from said central region are separated from said semiconductor crystal by the thickness of said relatively thick insulating mask which minimizes the capacitance and maximizes the resistance between said semiconductor crystal and said heat sink and thus minimizes microwave losses in said devices, and

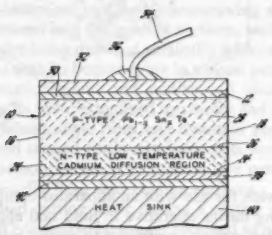
g. removing a predefined portion of a region of said semiconductor crystal surrounding said central region and also removing a predefined portion of a region of said insulating mask surrounding the contact metalization making electrical contact with said central region to further minimize microwave losses in said devices and improve the high frequency performance thereof.

4,064,621

CADMIUM DIFFUSED $PB_{1-x}Sn_xTe$ DIODE LASER

Wayne Lo, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 16, 1976, Ser. No. 723,803
Int. Cl.[2] H01L *7/00*
U.S. Cl. 29—569 L **3 Claims**



1. A method of making a higher power, more tunable lead-tin telluride infrared laser, said method comprising:

placing a body of low dislocatin density monocrystalline P-type semiconductive material in a chamber to receive cadmium as a diffusant, said semiconductive material having the composition $Pb_{1-x}Sn_xTe$ with x being a value from zero to about 30 mol percent that is selected to provide a band gap corresponding to a photon of infrared radiation of a predetermined wavelength within a range of 6.5 – 32 microns;

placing in said chamber a quantity of cadmium that is equal to about 0.05 – 0.08 milligrams of cadmium per cubic centimeter of chamber volume;

closing said chamber while it is evacuated to a pressure no greater than about 1×10^{-6} Torr;

heating said chamber at a preselected rate of about 50° – 500° C. per hour to a diffusion temperature of about 350° – 500° C.;

maintaining said diffusion temperature for a preselected duration up to about 2 hours to diffuse cadmium into a surface of said body and form a planar, high injection efficiency PN junction in said body that is parallel to and at a preselected depth below said surface;

cooling said body in said chamber from said diffusion temperature at a preselected rate of about 50° – 500° C. per hour to a temperature of about 150° C.;

cooling said body to room temperature at any rate, and removing it from said chamber at any time, after said body has been cooled to about 150° C. in said chamber;

contouring and polishing said body into a predetermined form that has a laser cavity adjacent said PN junction for collecting and amplifying infrared radiation of said predetermined wavelength;

applying ohmic contacts to said body by which a voltage can be applied across said PN junction to generate said infrared radiation of predetermined wavelength for collection and amplification in said laser cavity; and

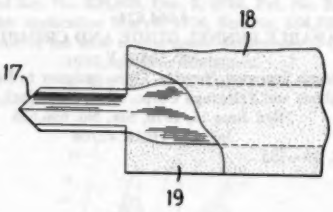
placing said contoured and polished body in intimate thermal association with cooling means for removing heat produced during generation, collection and amplification of said infrared radiation.

4,064,622

METHOD OF MAKING A FLEXIBLE JUMPER STRIP

Gilbert Morris, Amherst, and Richard P. Heinrich, Westville, both of N.H., assignors to Teledyne Electro Mechanisms, Nashua, N.H.

Filed Apr. 30, 1976, Ser. No. 681,780
Int. Cl.[2] H05K *3/06*; H01R *43/00*
U.S. Cl. 29—625 **8 Claims**



1. A process for making a jumper strip with pin-like lead ends comprising the steps of:

laminating a conductor sheet and a smaller adhesive coated first insulation sheet together so that the conductor sheet extends beyond the area of the first insulation sheet in the area where the jumper pins are to be formed;

etching the conductor sheet so as to form a conductor pattern from the conductor sheet, which pattern includes conductor leads ending in the area beyond the first insulation sheet, the conductor pattern in the area extending beyond the first insulation sheet also having a dam area connecting the leads, said dam area beginning at a certain distance from the first insulation sheet and ending at a certain distance from the end of the leads;

folding the conductor pattern in the area of the dam so that the leads which were beyond the dam area rest on a portion of the leads before the dam area extending onto the first insulation sheet;

forming a jumper pin at the end of each lead in the area beyond the first insulation sheet, said pins extending from a position on the first insulation sheet to the lead end, and

imparting a V-shaped cross section to the pins in their transverse direction in at least part of those portions of the pins that extend beyond the first insulation sheet.

4,064,623

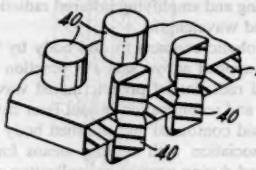
METHOD OF MAKING CONDUCTIVE ELASTOMER CONNECTORS

John R. Moore, Santa Ana, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 642,686, Dec. 22, 1975. This application Oct. 28, 1976, Ser. No. 736,435

Int. Cl.[2] H01R 43/00

U.S. Cl. 29—629 **8 Claims**



1. A method of making a conductive elastomer connector comprising the steps of:

providing a laminate having upper and lower surfaces comprising an insulative substrate having metal layers bonded to the top and bottom surfaces thereof:

forming openings through said laminate;

filling said openings with a conductive elastomer thereby forming conductive elastomer rods within said openings, said conductive elastomer rods extending only between said upper and lower surfaces of said laminate and removing said metal layers from said substrate with said conductive elastomer rods remaining in said substrate and thereby extending above and below the respective top and bottom surfaces thereof.

4,064,624

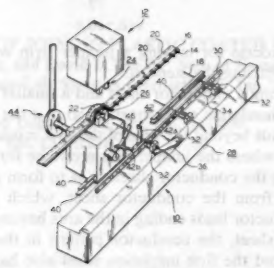
SEPARABLE FUNNEL GUIDE AND CRIMPING DIE ASSEMBLY

Paul Joseph Spangler, Novelty, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 16, 1976, Ser. No. 696,638

Int. Cl.[2] H01R 43/04

U.S. Cl. 29—753 **9 Claims**



1. An automatic terminal applicator machine wherein terminals on a continuous belt and extending laterally thereof are crimped onto the stripped ends of insulated wires which are inserted into the insulation and wire barrels of the terminals, said applicator comprising:

a pair of cooperable dies, said dies being movable relatively towards and away from each other to crimp a terminal located therebetween onto the stripped end of an insulated wire and each die including insulation and wire crimping portions;

belt feeding means adjacent one side of said dies, said feeding means being effective to index said belt along a path extending past said dies on said one side thereby to locate the leading terminal on said belt between said dies;

means cooperating with said feeding means for positioning a wire transversely of said belt and substantially coaxial with said leading terminal;

means for inserting said wire into said leading terminal;

means for guiding said wire into said terminal comprising a separable wire guide having first and second complementary sections respectively fastened to said crimping dies at the other side thereof and translatable therewith, wherein a funnel is formed when said dies are closed, said funnel being closed in its radial direction and having an aperture at the apex thereof which is immediately adjacent and abutting against said leading terminal and whose cross-sectional area is no greater than the cross-sectional area of the adjacent insulation barrel of said terminal; and,

means for ejecting said wire in the feeding direction of said belt after said dies have crimped said leading terminal on said wire and said funnel guide sections have moved away from each other.

4,064,625

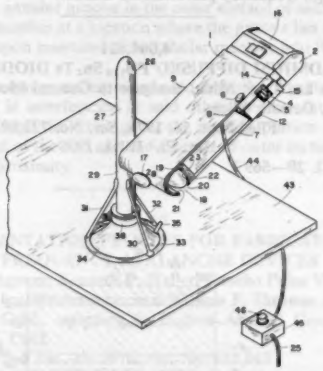
FUNCTIONAL APPARATUS AID

Henry Timothy Mansfield, P. O. Box 434, Barnwell, S.C. 29812

Filed Nov. 25, 1975, Ser. No. 635,255

Int. Cl.[2] B26B 21/40

U.S. Cl. 30—90 **35 Claims**



1. A device for use with an apparatus comprising:

a. holding means operative to hold said apparatus;

b. stabilizing means operative to secure said holding means in a stable position, said stabilizing means comprising support means operative to support said device, and attaching means operative to attach said device to said support means; said attaching means comprising a base; a single continuous arcular piece, with an opening, emanating from said base; and fastening means extending through said arcular piece operative to fasten said support means within said opening in said arcular piece; and

c. wherein said holding means comprises a structure containing an opening within which said apparatus may be held, said structure comprising a plurality of sides surrounding said opening in which said apparatus may be held, and overlapping members comprising one of said plurality of sides.

28. An apparatus to support a device comprising:

a. suction means operative to create a suction force on a surface;

b. bar means extending vertically from and attached to said suction means; and

c. means to stabilize said suction means including a ring stabilizer comprising a stabilizing ring and a plurality of stabilizing rods attached to said bar means, said ring stabi-

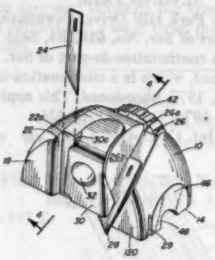
lizer surrounding the outer perimeter of the suction means.

4,064,626

CUTTER FOR SHEET MATERIAL

Avram Meshulam, Edison, N.J., and Jerome I. Rebold, Timonium, Md., assignors to CBS Inc., New York, N.Y.

Filed Sept. 9, 1976, Ser. No. 721,911
Int. Cl.² B26B *29/00*
U.S. Cl. 30—287 **8 Claims**



1. A cutting instrument adapted to slide upon the upwardly disposed flat surface of a work-piece in order to cut an edge thereon at a desired one of two predetermined angles, said instrument comprising:

a body member of generally hemispheroidal shape dimensioned to be comfortably grasped in the palm of the hand, the diametral plane of which constitutes a flat bottom for moving over the work-piece, said body portion having first and second external spaced-apart flat guiding surfaces disposed in a common vertical plane intersecting said flat bottom for guiding its movement parallel to a straight edge with which said guiding surfaces may be placed in contact, and having first and second parallel, spaced-apart, flat-bottomed cutting blade-receiving slots formed therein between said flat guiding surfaces, said first blade-receiving slot being disposed vertically with respect to the flat bottom with its bottom lying in a plane parallel to said common vertical plane and said second blade-receiving slot having its bottom inclined upwardly and inwardly at a predetermined angle from said common vertical plane, said first and second blade-receiving slots both intersecting said flat bottom along a common line parallel to and spaced inwardly from said guiding surfaces,

a flat, elongated cutting blade having a cutting edge at one end thereof adapted to be snugly received in either of said first or second blade-receiving slots with its cutting edge extending beyond the flat bottom of said body member, and

clamping means manually operable after a blade placed in a selected blade-receiving slot has been adjusted to the desired cutting depth for securing the cutting blade against the flat bottom of the selected blade-receiving slot.

4,064,627

CARPET CUTTER

Vincent Zanfini, 7569 SE. Gull Way, Hobe Sound, Fla. 33455

Filed Dec. 15, 1976, Ser. No. 750,838
Int. Cl.² B26B *29/00*
U.S. Cl. 30—287 **3 Claims**

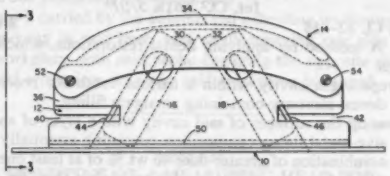
1. A carpet cutter comprising

a base adapted to be drawn across the floor and having a plate that fits under the flange of an anchoring strip about which the edge of the carpet is to be folded so that the edge of the plate forms a guide for the cutter,

a generally vertical frame mounted on the base and having opposed ends and generally flat vertical surfaces,

a pair of horizontal slots in the frame extending toward the center of the frame, one from each end and disposed above the base,

a pair of blades provided in the frame between the flat vertical surfaces and with one blade intersecting each horizontal slot, said blades lying in a plane parallel to the edge of



the plate and spaced from said edge a distance which causes the cut made by either blade to form a margin on the carpet that can be folded under the flange,

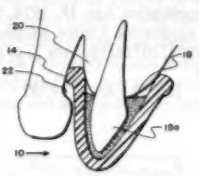
and a handle for manually engaging the cutter and carried on the frame.

4,064,628

DISPOSABLE DENTAL TRAY FOR TOPICAL APPLICATION OF FLUORIDE GEL AND OTHER DENTAL MEDICATIONS

Stewart Weitzman, Portland, Oreg., assignor to Pacemaker Corporation, Portland, Oreg.

Division of Ser. No. 529,609, Dec. 5, 1974, Pat. No. 3,955,281.
This application Mar. 8, 1976, Ser. No. 664,818
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² A61C *7/00*
U.S. Cl. 32—14 B **3 Claims**



1. In an applicator tray, for topical application of fluoride gel and other dental medications to the teeth, which is of the type comprising an arcuate mouthpiece with a channeled interior recess having a generally U-shaped cross-section and configured to fit over either of the upper and lower teeth of the mouth, the improvement wherein said tray consists essentially of a molded unitary element comprised of flexible, non-hydrotropic fine-cell polymeric foam material, and the bottom and wall surfaces of the interior recess forming said U-shaped channel is anatomically configured at the time of molding of said tray with indentations adapted to mate in reverse impression with the mouth dentition pattern, whereby a comfortable, non-gagging fit of said tray inside the mouth is obtained with said bottom and wall surfaces of said tray being in close proximity to the tooth surfaces and the perimeter of the tray walls being flexed by the bite of the mouth to contact the adjacent periodontal tissue to thereby provide a snug seal therewith and prevent the contamination and dilution by saliva of medication contained in said tray.

4,064,629

CAVITY LINER FOR DENTAL RESTORATIONS

Glenn E. Stoner, and Lyle D. Zardiackas, both of Charlottesville, Va., assignors to The University of Virginia, Charlottesville, Va.

Filed Jan. 26, 1976, Ser. No. 652,238
Int. Cl.[2] A61K 5/01
U.S. Cl. 32—15 8 Claims

1. A method for applying dental restorations, which comprises:

preparing a cavity within a carious tooth for receiving a dental mercury-containing amalgam filling;

coating the surfaces of said cavity with a layer of an adhesive-metal lining composition consisting essentially of the combination of greater than 46 wt.% of at least one finely divided pure metal at a position higher than tin on the International E.M.F. Series characterized by a corrosion resistance which is higher than the corrosion resistance of said subsequently applied dental amalgam and which has a capability of being amalgamated by diffusion of the mercury into said lining and which has a particle size of less than 400 mesh, with less than 54 wt.% of an ahesive selected from the group consisting of polycarboxylate cements, zinc silico-phosphate, zinc phosphate, copper phosphate, silicate, zinc oxide-eugenol, zinc oxide-eugenol-o-ethoxybenzoic acid, and a resin, to a thickness of less than 100 μ, wherein said composition contains up to about 0.1 wt.% of a wetting agent and a volatile solvent in the final dried form; and

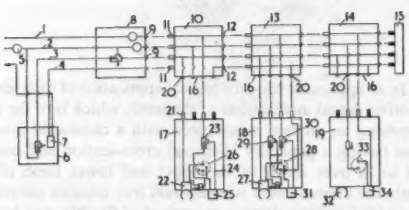
packing said remaining adhesive-metal coated cavity with a Ag-Hg-Sn dental amalgam, whereby free mercury present in said amalgam is diffused into and amalgamates with said metal of said adhesive-metal lining coating so as to form an integral restoration of said dental amalgam and said coating which is corrosion resistant and said adhesive effectively promotes adhesion between said integral restoration and said cavity surfaces.

4,064,630

DENTAL UNITS AND THE LIKE

Herbert Percy Killick, Blackpool, England, assignor to C.M.W. Laboratories Limited, London, England

Continuation-in-part of Ser. No. 239,259, March 29, 1972, abandoned. This application Apr. 18, 1974, Ser. No. 461,868
Claims priority, application United Kingdom, May 2, 1973, 20727/73; May 2, 1973, 20728/73; May 2, 1973, 20777/73; July 18, 1973, 34250/73
Int. Cl.[2] A61C 19/00
U.S. Cl. 32—22 3 Claims



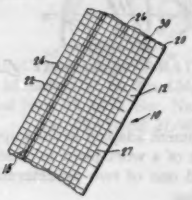
1. A service supply system for supplying at least air and water to a dental instrument comprising a supply unit having air and water sources and respective air and water outlets a first coupling module having at least two first conduits extending therethrough from respective air and water inlets to an air and a water outlet, self-sealing coupling members at each end of said air and water conduits normally sealing the inlet and outlet ends of said conduits, a control module having at least two control conduits extending therethrough having dental instrument control means operatively connected to said conduits, said control module having self-sealing mating coupling members at the respective inlet ends of said control conduits disposed for simultaneous releasable connection to said self-sealing coupling members of said first coupling module and operable when connected to said self-sealing coupling members to establish fluid communication between said conduits in said coupling module and said control conduits, said self-sealing coupling members automatically sealing the respective ends of said conduits when disconnected from their mating coupling members.

4,064,631

SEWING TAPE

Kineko Gebert, 301-G Park Hill Drive, Pewaukee, Wis. 53072

Continuation-in-part of Ser. No. 618,084, Sept. 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 467,342, May 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 333,961, Feb. 20, 1973, abandoned. This application Sept. 24, 1976, Ser. No. 726,426
Int. Cl.[2] A41H 1/00
U.S. Cl. 33—2 R 9 Claims



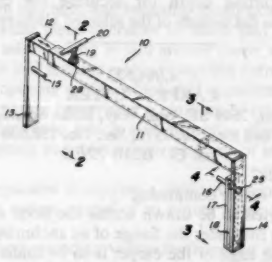
1. A tape for use in the sewing of fabrics comprising an elongated unperforated strip of paper, said strip comprising paper towelling having sufficient pliancy and exterior fibrous properties to require a force of at least approximately 1.98 grams to displace a 7 inches by 1 ½ inches portion of the tape along the surface of a hard finish broad cloth, said tape having a pair of longitudinal edges, a first longitudinal line of said tape spaced from a longitudinal edge by an amount equal to a preselected seam width, a plurality of transverse lines normal to said longitudinal edges spaced apart by a unit of measurement and suitable for performing measurements along said edge, and a plurality of additional longitudinal lines on said tape having the same spacing as said transverse lines to form a pattern with said transverse lines having a plurality of rows of squares and suitable as a guide for decorative needlepoint sewing.

4,064,632

TIRE CALIPER

Donald E. Waldecker, 112 Gordon Road, Falls Church, Va. 22046

Filed Aug. 27, 1976, Ser. No. 718,383
Int. Cl.[2] E21B 47/08; G01B 5/00
U.S. Cl. 33—143 D 5 Claims



1. A caliper for comparing the diameters of the wear treads of a plurality of tires comprising: first and second telescopi-

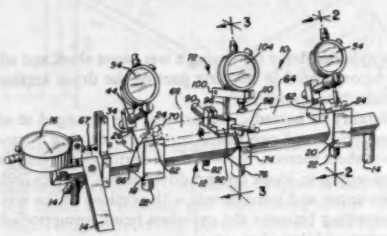
cally engaged and adjustable portions each having at least one exposed end; a first arm affixed to one exposed end on the first of said portions; a second arm affixed to one exposed end on the first of said portions; a second arm affixed to one exposed end on the second of said portions; a projection on said first arm extending toward a projection on said second arm; said arms and said projections being oriented relative to said portions and relative to each other so that said arms can be caused to engage spaced wear tread portions of a tire when said projections are caused to engage the same side of said tire; and gaging means pivotally mounted on one of said projections which can be disposed between the arm upon which said one projection is carried and a wear tread portion of said tire at the option of a user.

4,064,633

GAUGING INSTRUMENT

Alexander W. Wertepny, 2063 Craig Drive, Des Plaines, Ill. 60018

Filed Mar. 10, 1976, Ser. No. 665,540
Int. Cl.² G01B *5/10, 5/25*
U.S. Cl. 33—147 E **11 Claims**



1. In a gauging instrument
a mounting bar,
means for supporting said mounting bar in a spaced relation with respect to a surface,
a pair of V-blocks carried by said mounting bar and being longitudinally movable along said mounting bar,
means for locking said V-blocks relative to said mounting bar,
a support means carried by each V-block, and
a dial indicator means carried by each said support means and having a probe extending toward one surface of the "V" of the V-block whereby a workpiece positioned on said V-blocks is engaged by one of said probes for gauging the roundness and measuring the diameters of said workpiece.

10. In a gauging instrument
a mounting bar,
means for supporting said mounting bar in a spaced relation with respect to a surface,
a mounting block, carried by said mounting bar and being movable along said mounting bar,
means for locking said mounting block relative to said mounting bar,
a shaft carried by said mounting block,
a rod connected to one end portion of said shaft,
a base member resiliently carried by said rod,
an anvil projecting outwardly from said base member,
a second rod projecting upwardly from said base member at substantially a right angle with respect to said anvil, and
a dial indicator means carried by said second rod with a probe extending toward said anvil whereby a workpiece is engaged between the anvil and the probe for measuring the diameter of said workpiece.

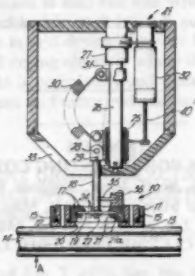
11. In a surface stand having a base,
a column mounted for limited pivotal movement and extending generally vertically relative to said base,
a mounting block carried by said column and being movable vertically along said column,
means for locking said mounting block relative to said column,
a dial indicator means carried by said mounting block with a probe extending therefrom, and
an anvil carried by the column and extending up through an opening in said base, said anvil engaging one side of a workpiece with said probe engaging the opposite side of said workpiece whereby said workpiece is gauged.

4,064,634

MOUNTING OF A MEASURING HEAD FOR POSITIONING RELATIVE TO A STRUCTURE

Dan Bryan Davis, Lachine, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed June 21, 1976, Ser. No. 698,461
Claims priority, application Canada, Apr. 30, 1976, 251517/76
Int. Cl.² G01B *5/04, 5/10*
U.S. Cl. 33—147 L **8 Claims**



1. A measuring head and a mounting therefore, the head having a peripheral rim defining a recess in a bottom surface and including an aperture extending from said recess through to a top surface, the centre of gravity of the measuring head lying within said recess; a diaphragm of elastomeric material in said recess and extending across said aperture; means securing said diaphragm at its periphery to said head; and a support rod extending from said head in a direction away from said bottom surface, said support rod attached at one end to said diaphragm at its centre.

4,064,635

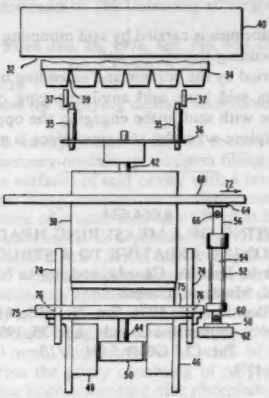
APPARATUS FOR DRYING PLASTIC TRAYS

Henry Y. Kuhl, Kuhl Road, Flemington, N.J. 08822

Filed June 17, 1976, Ser. No. 696,974
Int. Cl.² F26B *17/30*
U.S. Cl. 34—58 **8 Claims**

1. For use with a conveying system or other similar transferring device, an apparatus for drying articles comprising:
a. a drying zone for receiving at least one wet article to be dried traveling along a conveyor system;
b. a vertically and rotatably movable carriage assembly positioned below said drying zone and adapted to move upwardly to lift and move the article above the conveyor;
c. a rotational control means secured to said carriage assembly and adapted to cause rotation of said carriage assembly and to increase the rotational velocity of said carriage assembly to expel liquid from the article to be dried, said rotational control means also adapted to decrease rotational velocity and stop rotation of said carriage assembly to allow replacing of the article on the conveyor; and
d. a vertical moving means for selectively causing said car-

riage to move into contact with the undersurface of the article located in said drying zone on the conveyor and



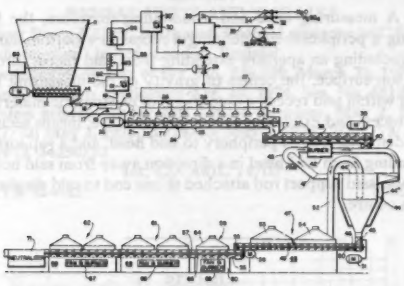
vertically move the article to a position above the conveyor.

4,064,636

APPARATUS FOR DELINTING COTTONSEED

James D. Downing, Scott, Miss., assignor to Delta and Pine Land Company of Mississippi, Scott, Miss.

Filed Jan. 2, 1976, Ser. No. 646,267
Int. Cl.[2] F26B *19/00*; D01B *1/04*
U.S. Cl. 34—60 9 Claims



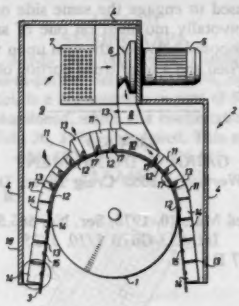
1. Apparatus for the acid delinting of cottonseed having surface fibers of cotton comprising means for establishing and conveying along a path an agitated body of said cottonseed to be delinted, means for spraying acid onto said seed while it passes along a predetermined portion of the path to wet said fibers, control means for combining acid and seed at such respective rates of supply that substantially only enough acid is sprayed onto the seed as can be absorbed into said fibers and said acid being capable of degrading said cotton fibers, and means for drying said wet seed comprising means for subjecting wet seed agitation while passing hot air therethrough, including a conduit through which the wet seed is initially moved by pressurized hot air, a cyclone separator into which said conduit discharges the now partially dried seed, bottom perforated trough means receiving seed from said cyclone separator, conveyor agitator means for moving the seed along said trough means, and means for passing hot air through the agitated seed all along said trough means for completing drying of the fibers and removal of degraded fibers from the seed.

4,064,637

CYLINDER DRYER FOR PAPER MACHINES

Stig Rune Lindgren, Vaxjo, Sweden, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

Filed Mar. 18, 1976, Ser. No. 667,853
Claims priority, application Sweden, Mar. 19, 1975, 7503134
Int. Cl.[2] F26B *11/02*
U.S. Cl. 34—122 14 Claims



1. A cylinder dryer for drying a wet paper sheet and adapted to be incorporated in the first part of the dryer section of a paper machine, comprising:

a plurality of heated cylinders that are arranged at at least one upper and one lower level for receiving a travelling wet sheet thereon, the wet sheet during the drying process travelling in loops up and down around the cylinders of the upper and lower levels with portions of the wet sheet travelling between the cylinders being unsupported;

a source of blown hot air;

hoods provided for at least some of said heated cylinders, said hoods covering part of the curved surfaces of their respective heated cylinders, each of said hoods being coupled to said hot air source and having first orifice means arranged for blowing hot air at least substantially perpendicularly on to the sheet travelling from one cylinder to another;

the improvement wherein:

at least the hoods for the upper level heated cylinders have extended wing members whose surfaces facing the wet sheet extend along at least a substantial portion of said wet sheet that travels unsupported by, and between, alternate heated cylinders, said wing members projecting substantially parallel and in close proximity to said unsupported portions of said wet sheet; and

said surfaces of said extended wing members have second orifices arranged for blowing streams of hot air substantially parallel to said unsupported portions of said wet sheet in both the same direction as its direction of travel and opposite to its direction of travel for stabilizing the said sheet.

4,064,638

APPARATUS FOR DRYING SEEDS

Zenas Allen Stanfield, Bloomington, Ill., assignor to Ciba-Geigy AG, Basel, Switzerland

Filed June 30, 1976, Ser. No. 701,734
Int. Cl.[2] F26B *17/12*
U.S. Cl. 34—174 5 Claims

1. An apparatus for continually drying a granular material comprising:

a cylindrical housing having a roof thereon with an aperture at the center of said roof, said housing having closable openings therein, one of which is a discharge opening in the side of said housing;

a downwardly directed conical wall filling the entire inter-

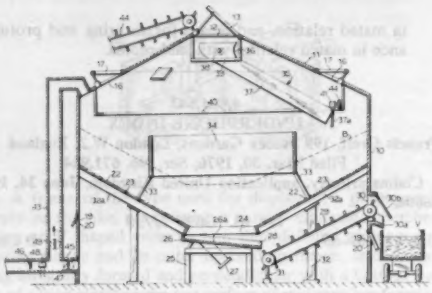
nal cross-section of said housing and having a plurality of perforations distributed evenly therein and having an opening at the bottom thereof;

an open sided pan beneath said bottom opening of said conical wall and inclined toward said open side;

a vibrator operatively associated with said pan for vibrating said pan in a direction parallel to the bottom of said pan;

a discharge conveyor in said housing having one end beneath the open side of said pan and the other end at said discharge opening;

a distributing chute in the upper part of said housing above said conical wall and having a funnel-shaped receiving portion beneath the opening in said roof and a distributing pipe extending from the bottom of said funnel-shaped receiving portion downwardly and outwardly from the



center of said housing to adjacent the interior periphery of said housing;

a distributing chute rotating means coupled to said distributing chute for rotating said distributing chute with said funnel-shaped receiving portion beneath said opening in said roof and the end of the distributing pipe moving around the periphery of said housing;

a gaseous drying medium inlet pipe opening into said housing below said conical wall and having a gaseous medium pumping means therein and a heater and a damper downstream of said pumping means; and

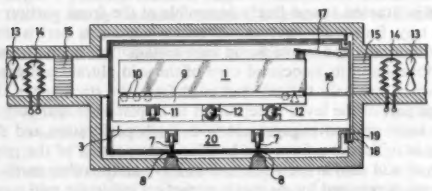
a reverse flow pipe extending from said inlet pipe between said heater and said damper and through said roof into the space above said conical wall and having a further damper therein.

4,064,639

INSTALLATION FOR DRYING MOLDED BLANKS

Carl Otto Pels-Leusden; Robert Stupperich; Hans-Bernd Weber, and Rudi Reinders, all of Essen, Germany, assignors to Institute fur Ziegelforschung Essen e.V., Essen, Germany

Filed Aug. 18, 1975, Ser. No. 605,483
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—212 **15 Claims**



1. A drying installation for the drying of molded blanks such as plank bricks, large surface structural members of ceramic materials and the like comprising:

a substantially closed longitudinally extending drying chamber separated into a plurality of adjacently arranged parallel drying channels, each said drying channel comprising at least one blower with adjustable flow direction, at least one heater, at least one air straightener, said parallel drying channels being separated into two groups, said chamber having an entry end and an exit end;

air supply means coupled to each of said parallel drying channels for successively admitting and guiding dry air having different temperature, humidity, flow rate, and quantity;

means for switching said two groups of said drying channels in series with respect to said air supply means to guide the dry air in an alternate direction through said parallel arranged drying channels;

conveyor means for moving the blanks in a longitudinal direction through said drying chamber, said conveyor means being guided perpendicularly with respect to the flow of the dry air through said adjacently arranged drying channels;

means for admitting drying air to one of said two groups of channels at the entry end where the blanks enter said drying chamber and in the same direction of movement as said conveyor means, means for admitting drying air to the other of said two groups of channels in a countercurrent flow opposite to the direction of movement of said conveyor means at said exit end where the blanks leave said drying chamber; and

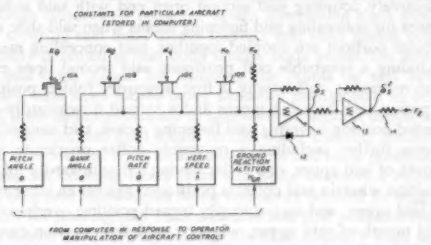
exhaust means in said drying chamber for drying air at the point in said drying chamber where the shrinking process of the blanks is completed, said exhaust means being located between said entry end and said exit end.

4,064,640

FOUR-POINT GROUND REACTION FOR SKID EQUIPPED HELICOPTERS

Thomas R. Cummings, and Anthony J. Mazza, Jr., both of Binghamton, N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,254
Int. Cl.[2] G09B *9/08*
U.S. Cl. 35—12 K **4 Claims**


CONSTANTS FOR PARTICULAR AIRCRAFT (STORED IN COMPUTER)
PITCH ANGLE
BANK ANGLE
PITCH RATE
VERT. SPEED
GROUND REACTION ALTITUDE
FROM COMPUTER IN RESPONSE TO OPERATOR MANIPULATION OF AIRCRAFT CONTROLS

1. In an aircraft simulator comprising a simulated aircraft cockpit with controls operable by a trainee, said cockpit being mounted on a moving platform which is coupled to a computer system responsive to the trainee's manipulation of the cockpit controls to provide drive signals to move the platform to simulate the response cues the actual aircraft would experience were a pilot to move the controls of the aircraft in the same manner as the trainee operator of the simulator aircraft, a method for simulating realistic ground handling of a skid-equipped helicopter comprising the steps of:

a. storing in said computer system the aircraft dynamic control responses, the constant multipliers of said dynamic control responses, and the equations of motion representative of a selected skid-equipped helicopter;

b. deriving first signals representative of helicopter ground reaction forces resulting at each skid's strut attach points from said trainee's manipulation of said cockpit controls;

c. combining said first signals representative of ground reac-

tion forces with the data stored in said computer system representative of said selected skid-equipped helicopter so as to derive conventionally within said computer system second signals representative of all other forces and moments affecting said helicopter as a result of said trainee's manipulation of said cockpit controls;

d. driving said aircraft simulator into motion in response to said second signals to provide response cues for said trainee operator to react to similar to the response cues provided by said actual, selected skid-equipped helicopter whereby, the signals representative of aircraft motion now including ground reaction affects for each strut attach point, the "light-on-skids" maneuver may be experienced by said trainee.

4,064,641

FOOTWEAR

Beth Levine, New York, N.Y., assignor to Betherb, Inc., New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,123
Int. Cl.[2] A43B 3/00; A41D 1/06
U.S. Cl. 36—1.5 **9 Claims**

1. In an article of footwear, the combination of a shoe portion comprising an upper, a mouth in said upper for accommodating entry of a foot therein, a tubular portion detachably coupled to said shoe portion, said tubular portion having first and second open ends, said first open end for receiving a foot therein prior to its entry into said mouth, fastening means for selectively coupling said second open end with said mouth, means for concealing said fastening means when said shoe and tubular portions are coupled together, said concealing means including a reversible cuff proximate said second open end, said reversible cuff having a first upwardly folded position exposing said fastening means and a second downwardly extended position covering said fastening means, said concealing means further including a reversible collar proximate said mouth of said upper, said collar having a first inwardly folded position wherein said collar is positioned against an inner wall of said upper, and an outwardly turned position overhanging said mouth of said upper, whereby said shoe portion can be used alone as a low boot and also can be used in combination with said tubular portion as a high boot.

4,064,642

WALKING BOOT ASSEMBLY

Hubert C. Vykukal; Alan B. Chambers, both of Los Altos, and Roy H. St. John, Los Gatos, all of Calif., assignors to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

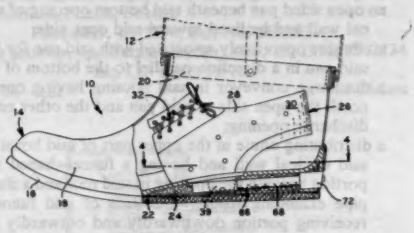
Filed Dec. 23, 1976, Ser. No. 753,976
Int. Cl.[2] A43B 7/16, 5/04; A62B 17/00
U.S. Cl. 36—92 **8 Claims**

1. In a walking boot assembly, the combination comprising:

A. a bootie having a sole and an upper portion adapted to be attached to a foot of a wearer;

B. a walking boot having an inner sole and an upper portion for receiving said bootie; and

C. coupling means for releasably attaching said bootie to the walking boot, said coupling means including a protuberance affixed to the sole of said bootie, a recess defined in the inner sole of said boot for receiving said protuberance



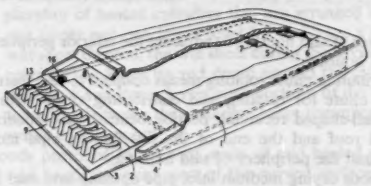
in mated relation, and means for securing said protuberance in mated relation with said recess.

4,064,643

UNDERPHONE INDEX

Francis Greif, 199 Sussex Gardens, London W.2, England

Filed Mar. 30, 1976, Ser. No. 671,954
Claims priority, application United Kingdom, June 24, 1975, 26806/75
Int. Cl.[2] G09F 11/30
U.S. Cl. 40—65 **9 Claims**



1. An index of the type herein defined comprising an outer housing adapted to stand beneath a telephone; an inner housing in the form of a tray slideably mounted within the said outer housing for movement with respect thereto between an inner retracted position where only a front portion of said tray is exposed and freely accessible and an outer withdrawn position where said tray extends through a substantial distance forwardly beyond said housing with only an inner rear portion of the tray remaining in engagement with said housing; a plurality of superposed cards for bearing information such as names, addresses and telephone numbers of telephone subscribers; magnetic means on the cards and housing to provide mutual attraction therebetween; and a plurality of manually operable card selection members provided on the tray; wherein each said cards has at a front end a perforated tab in a different position from the tabs of the other cards and each said card selection member comprises a lever of which a front exposed part is situated at and freely accessible at the front portion of the tray, forwardly beyond said tabs while a rear part is situated beneath and movable up into engagement with the tab perforation of its associated card of the said plurality of cards to withdraw only the selected card from the stack when the front part of the lever is depressed to displace the rear part of the lever up into engagement with a tab perforation and the tray is withdrawn from the housing, irrespective of the position of said card in the stack, and to leave all the other cards of the stack retained by magnetic attraction inside the said outer housing, all of the structure of said tray and all of the structure of said plurality of manually operable card selection members being situated beyond a space over said plurality of superposed cards, including said perforated tabs at said front ends thereof, so that said cards are carried by said tray with said front end of each card uncovered and freely accessible when the tray is moved with respect to said outer housing to a withdrawn, open

and extended position so that any card can be conveniently removed and replaced for the purpose of changing or adding information on the card.

4,064,644

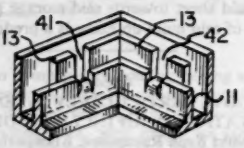
FRAME CONSTRUCTION AND CORNER CLIP APPARATUS

Richard F. Warner, Fort Lee; William Billand, Montville, and Riggi Vincent, Union, all of N.J., assignors to Arthur Dash and Jay Reidel, both of Bronx, N.Y., part interest to each

Filed May 14, 1976, Ser. No. 686,319

Int. Cl.[2] E04C *2/38*

U.S. Cl. 40—152 **1 Claim**



1. A frame of the type used for displaying a photograph, picture or the like, comprising a unitary elongated member, having an F-shaped cross section thus defining an inner upstanding flange and an outer upstanding flange, said flanges being integrally formed and perpendicular with a bottom surface of a base member, the top surface of said member forming the front of said frame, said frame being fabricated by forming V-shaped notches in said member at selected intervals, said notches formed along the length of said bottom surface of said base member and through said inner-most flange, and scored depressions located at the base of said V notch and along the outer-most flange for bending said frame at said scored lines to cause the sides of said "V" notches to coact with each other, thus forming three corners of said frame, with a fourth corner indicative of the opposite ends of said member, means inserted between said first and second upstanding flanges at said fourth corner, said means including an "L" shaped bracket with the arms of said "L" of a substantially greater height than the width and of a greater height than said inner upstanding flange, said bracket including a first elongated aperture transverse to said arm on the top of one arm of said "L" and extending from said top along a major portion of said arm, and a second elongated aperture on the top of said other arm of said "L" and relatively congruent to said first aperture, and indented inner flange material directed through said first and second apertures to firmly secure said frame at said fourth corner.

4,064,645

SACHET FOR THE ATTACHMENT OF STAMPS, TOKENS AND LIKE DEVICES TO CONTAINERS

William Wood, Naphill, England, assignor to Harrison & Sons (High Wycombe) Limited, High Wycombe and Green Shield Trading Stamp Company Limited, Edgware, both of, England

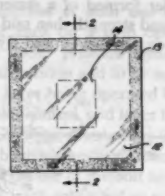
Filed May 23, 1975, Ser. No. 580,354

Claims priority, application United Kingdom, June 5, 1974, 24948/74

Int. Cl.[2] G09F *1/10*

U.S. Cl. 40—159 **2 Claims**

1. A sachet for holding a trade article and for attachment to an article of merchandise, comprising a paper backing sheet, a continuous transparent glassine facing sheet which is imperforate within its borders, a cold-seal adhesive coating completely covering a back surface of the facing sheet, a cold-seal adhesive coating on a front surface of the backing sheet at least completely around a peripheral band thereof, the cold-seal adhesive coatings sealing only when in contact with a corresponding coating, the facing and backing sheets being secured together by the coatings of cold-seal adhesive so as to form a completely enclosed pocket between the sheets, the transparent facing sheet being rendered impervious to moisture by the cold-seal adhesive coating on the back surface thereof, and a



heat-activated adhesive coating on a back surface of the backing sheet for fastening the sachet to an article of merchandise.

4,064,646

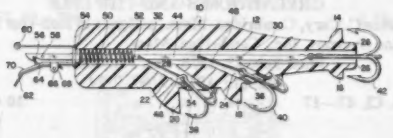
FISHING LURE

Mario J. Vercellone, and William S. Travers, both of 87 Wilbur Ave., North Dartmouth, Mass. 02747

Filed June 23, 1976, Ser. No. 698,892

Int. Cl.[2] A01K *85/00*

U.S. Cl. 43—42.41 **2 Claims**



1. A fishing lure comprising body means for drawing through the water to simulate fish bait, said body means having hook means retractably extending therefrom for hooking fish, said hook means mounted on retractor means secured to said body means for holding said hook means proximate to said body means, said retractor means releasing said hook means to hang free from said body means when said fishing lure is drawn through water, said retractor means comprising shaft means for securing said hook means thereto, said shaft means being slidably mounted in said body means, hook protection means on said body means for shielding the points on said hook means, said shaft means being slideably positionable to hold said hook means proximate to said hook protection means in a first position, said shaft means further being slideably positionable to move said hook means away from said hook protection means and to hang freely from said body means in a second position, said shaft means being releasably secured to trigger means for holding said shaft means in said first position, resilient means for resiliently biasing said shaft slideably from said first position to a said second position when said trigger is released, said trigger being released and said shaft being resiliently biased into said second position when said lure is moved through water, said trigger comprising sear means secured to pivotal diving plane means which is pivotally secured to stationary diving plane means, said stationary diving plane means being secured to said fishing lure, said pivotal diving plane means extending from said sear means for forcing said sear means to disengage said stop when said lure is drawn through water.

4,064,647

CATAPULT LAUNCHED MODEL GLIDER

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

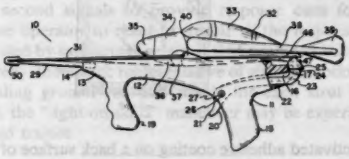
Filed June 7, 1976, Ser. No. 693,417

Int. Cl.[2] A63H *27/14*

U.S. Cl. 46—81 **5 Claims**

5. A gliding toy for use with a catapult launching device which launching device includes spring means rubber band for

catapulting said toy into gliding flight, said gliding toy being formed with a body portion made at least in part of low density cellular plastic having relatively low strength, an elongated spine-like member formed of a material having substantially greater rigidity and strength than said cellular plastic material forming said body portion of said flying toy, said elongated



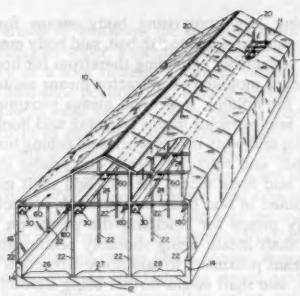
member being partly embedded within and secured to said body portion of said glider which is made of said low density cellular plastic, said elongated member having a downwardly extending protrusion near the rear end thereof to serve as a retaining means for the spring means of said catapult launching device when said launching device is operatively engaging said gliding toy during the act of catapult launching same.

4,064,648

WEATHER RESPONSIVE INSULATION SYSTEM FOR GREENHOUSES AND THE LIKE

Charles C. Cary, Cambridge, Mass., assignor to Roll-Out Insulation Systems, Inc., Cambridge, Mass.

Filed Feb. 23, 1976, Ser. No. 660,767
Int. Cl.[2] A01G *9/00, 9/24*
U.S. Cl. 47—17 **10 Claims**



1. In a greenhouse having a roof, a pair of spaced transverse end walls, and a pair of spaced longitudinally extending side walls, a system for reducing heat loss through the roof during one part of a day and for permitting sunlight to pass through the roof to a growing area within the greenhouse during a second portion of the day, said system comprising:

a flexible sheet of insulating material mounted within the greenhouse and arranged for movement between a storage position in which the sheet is stowed along a longitudinal side of said growing area and permits sunlight to pass through the roof to the growing area, and an insulating position in which the sheet is deployed in a generally horizontal plane extending across the growing area between the growing area and the roof;

support means engaging the sheet at spaced intervals along its length and supporting the sheet in the storage and insulating positions;

deploying means for moving the sheet from its storage to its insulating position;

retracting means for moving the sheet from its insulating to its storage position;

means providing a seal between each of the opposite longitudinal edges of the sheet and the most adjacent side wall of the greenhouse when the sheet is in its insulating position, said sheet and said means providing a seal substantially preventing heat loss from below said sheet to above said sheet when said sheet is in said insulating position; and,

control means operatively connected to and controlling said deploying means and said retracting means,

said control means including a snow-ice detection system for detecting the build-up of non-liquid precipitation and having a generally planar, imperforate, horizontal, upwardly-facing accumulation surface arranged to retain non-liquid precipitation incident thereupon and to permit liquid precipitation to spill over the edges thereof, and

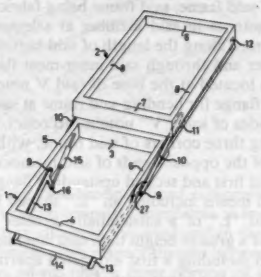
said control means being responsive to build-up of non-liquid precipitation on said accumulation surface to prevent said deploying means from moving said sheet towards said insulating position and to cause said retracting means to move said sheet towards said storage position when the weight of said build-up exceeds a predetermined level.

4,064,649

WINDOW, PARTICULARLY INTENDED FOR INSTALLATION IN AN INCLINED OR FLAT ROOF

Villum Benedikt Kann Rasmussen, Klampenborg, and Lars Erik Kann-Rasmussen, Holte, both of Denmark, assignors to V. Kann Rasmussen & Co., Soborg, Denmark

Continuation of Ser. No. 583,207, June 3, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,696
Int. Cl.[2] E05D *15/30, 15/42, 15/44*
U.S. Cl. 49—250 **4 Claims**



1. A window for installation in a roof of a building, comprising:

a rectangular frame, including a pair of lateral frame members, a bottom frame member, and a top frame member;

a sash, including corresponding lateral, top, and bottom sash members;

a pair of slide rails respectively extending displaceably along said lateral frame members and hingedly connected to said sash adjacent the top member thereof; and

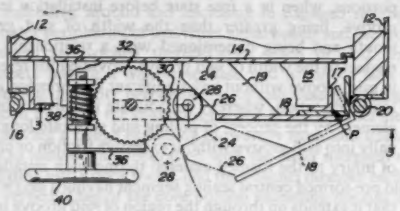
a pair of link arms having first ends respectively journaled to said frame at about the respective central regions of said lateral frame members and second ends journaled to said sash adjacent the bottom member thereof, said link arms at said first ends being interconnected through an internal maneuvering handle, said handle including a pair of lateral maneuvering arms connected to said link arms at said first ends, and a grip rod rigidly interconnecting said maneuvering arms and extending substantially perpendicular thereto at a point spaced from said first ends, displacement of said handle causing a corresponding displacement of the sash with respect to the fixed frame, said bottom member of the sash following a path, during the opening or closing motion of the sash, that is defined by the fixed length of the link arms, and said top of the sash moving laterally along a path defined by the slide rails, said slide rails being oriented in a plane parallel to and displaced from the plane defined by said link arms.

4,064,650

DOOR LATCH

A. Henry Schwab, Fort Washington, Pa., assignor to Philadelphia Tramrail Company, Philadelphia, Pa.

Filed May 4, 1976, Ser. No. 683,150
Int. Cl.[2] E05F 11/54; E05C 3/00
U.S. Cl. 49—277 13 Claims



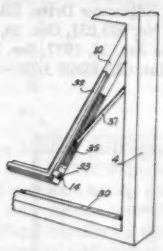
1. An apparatus comprising a housing having an opening, a door movably supported by said housing for movement from a position wherein it closes said opening to a position wherein the opening is unobstructed, latch means for controlling the initial opening movement of said door so that the door does not pop open, said latch means including a latch movably supported by the housing and overlying a portion of the door and a cam follower movably supported by the door, said latch having a cam surface cooperating with said cam follower to block opening movement of the door, means connected to the cam follower and selectively operable for moving the cam follower along the cam surface and in a direction away from the door until the cam follower is out of the path of movement of the cam surface on said latch whereby the latch and door are thereafter movable to an open disposition.

4,064,651

PIVOTED WINDOW

Juan Puigdomenech Homs, Calle Padre Huix, 1, VIC Barcelona, Spain

Filed Jan. 9, 1976, Ser. No. 647,915
Claims priority, application Spain, Jan. 15, 1976, 209532
Int. Cl.[2] E06B 7/205
U.S. Cl. 49—319 7 Claims



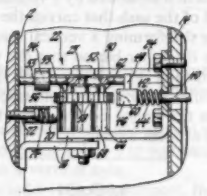
1. In a pivoted window comprising a fixed frame to which is articulated a movable frame pivotable to both sides of the fixed frame, and also a channel guide for a roller blind adapted to move together with the movable frame or to remain fixed, wherein the movable frame is provided with means for predetermining and fixing at least one inclined position, the said means being adapted to be operated by means of a drive device which at the same time acts on a device for locking the movable frame in its closed position, which is a bolt locking means whose bars project laterally outwardly so as to be received in cavities provided in the fixed frame, the improvement comprising wings fixed to a part of the blind guide remote from the pivot and provided with apertures adapted to come into alignment with ends of the closure bars of the bolt locking means when the guide and the frame are in adjacent positions, so that the said bars can pass through the said apertures, thereby constraining the blind guide to move with or be stationary with the pivoting frame, a sealing mechanism being provided in the fixed frame which comprises at least one articulated lever bearing at one of their ends on a strip carrying elastic lip adapted to be applied under pressure against the movable frame when in its closed position and to be moved away from the movable frame, the lever being operated by the end of the bar of the bolt locking mechanism, said lever being operatively linked to a displaceable element acted on by the end of the bar of the bolt locking mechanism, the displaceable element being urged toward the end of the bar of the bolt locking means, and comprising a projecting latch subjected to pressure by spring means and tending to project outside and enter the aperture in the wing of the blind guide, thereby to lock the latter against movement.

4,064,652

DOOR HOLD-OPEN MECHANISM

Laird E. Johnston, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 27, 1976, Ser. No. 690,527
Int. Cl.[2] E05B 65/06; E05C 17/00
U.S. Cl. 49—394 4 Claims

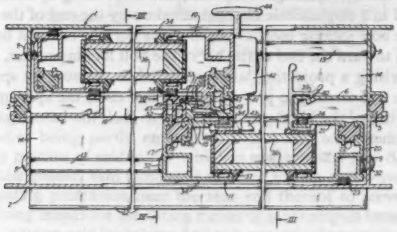


1. A door hold-open mechanism for use with a vehicular door, door frame and door hinge, said mechanism comprising a door latch assembly including inner and outer door handles, a latch wheel having a predetermined number of teeth formed thereon and operatively connected between said door and said door hinge, an index cam and a detent plate fixedly secured to oppositely disposed faces of said latch wheel and having a predetermined lesser number of teeth formed thereon than the number on said latch wheel, a latch segment operatively connected to said door latch assembly and having an end face contoured to match said teeth on said latch wheel, resilient means operatively connected to said latch segment for urging said contoured end face of said latch segment into engagement with said latch wheel, said latch segment being retained away from said latch wheel against the force of said resilient means upon actuation of said door latch assembly via one of said handles for permitting manual opening of said door to any of a predetermined plurality of desired hold-open positions whereupon release of said one of said handles permits said latch segment to be urged by said resilient means into engagement with said latch wheel, a spring-loaded detent plunger mounted on said door frame and biased into contact with a valley of said toothed detent plate for retaining said door in a selected open position, an index pawl slidably mounted on said door and adapted to abut against said door frame and contact said latch segment for disengaging said latch segment from said latch wheel while said door is being closed without said door latch assembly being actuated, and an index pin mounted on said index pawl for engaging said index cam during the closing movement of said door and rotating said index cam to a position wherein said index cam and, hence said latch wheel are reset for the next opening cycle.

4,064,653
SLIDING WINDOW

Robert P. Randall, Clinton, and Richard L. Torbett, Mars, both of Pa., assignors to Three Rivers Aluminum Company, Pittsburgh, Pa.

Filed Oct. 29, 1976, Ser. No. 737,089
Int. Cl.[2] E05D 15/08
U.S. Cl. 49—458 7 Claims

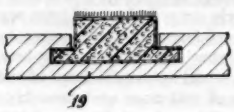


1. A horizontally sliding window comprising a pair of window sash disposed in parallel vertical planes with the right-hand end of one sash overlapping the left-hand end of the other sash when the window is closed, said overlapping ends including vertical sash rails, a vertical metal bar joined to each rail between it and the other sash, each bar having an inner and an outer vertical slot in it separated by a vertical flange and facing the opposite end of the sash that carries the bar, the outer side wall of the outer slot forming a vertical tongue extending into the outer slot in the other bar so that the tongues overlap in engagement with each other to interlock the two bars, and a vertical nonmetallic sealing strip connected to each bar and extending across the flange on the other bar in engagement with that flange to form a seal.

4,064,654
SEALED CLOSURES WITH WEATHER STRIPPING

Harold G. Olson, Westport, Conn., assignor to H. G. Olson & Co., Inc., Amesbury, Mass.

Continuation of Ser. No. 560,259, March 20, 1975, abandoned, which is a continuation of Ser. No. 371,304, June 18, 1973, which is a division of Ser. No. 186,237, Oct. 4, 1971, Pat. No. 3,758,992, which is a continuation-in-part of Ser. No. 44,977, June 10, 1970, abandoned. This application June 18, 1976, Ser. No. 697,576
Int. Cl.[2] E06B 7/23
U.S. Cl. 49—489 5 Claims



1. In a closure comprising relatively slidable members having a region of overlap to be sealed against infiltration of water and air by weatherstripping, one of said members being formed in said region with a groove which is generally T-shaped in cross-section so as to present a pair of parallel opposed lips in the outer surface of said one member adjacent the other member, said lips extending parallel to the bottom surface of said groove, the confined spaces between said bottom surface and the inner surfaces of said lips opposite said bottom surface serving to define an effective depth dimension of said groove, the separation between said lips establishing a groove mouth the width of which is substantially less than the width of said groove;

said weatherstripping comprising a sealing element including an elongate substrate in said groove formed with a core of foamed material providing flexibility and resilient compressibility;

said substrate being pre-formed, prior to installation in said groove, with marginal side portions and a central sealing segment of substantially greater height than said marginal side portions;

the width of said substrate including said marginal side portions, when in a free state before installation in said groove, being greater than the width of said groove mouth and being dimensioned with a relationship with respect to the width of said groove providing for retention in said groove without any significant compression in the lateral direction, whereby to facilitate installation of said element by the process of pulling said substrate longitudinally into said groove without excessive friction or chance of injury to the foamed material during such installation;

said pre-formed central sealing segment having a height such that it extends up through the region of said groove mouth to a position at least slightly above the level of said outer surface of said one member;

said substrate further having a bottom surface which conforms to the bottom surface of said groove across the full width of said substrate to provide vertically-reactive structural strength affording firm support for said pre-formed central sealing segment;

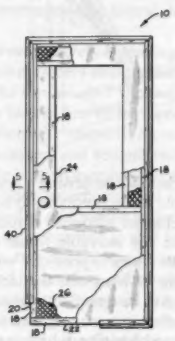
a tough outer skin on said substrate, at least on said pre-formed central sealing segment, to enhance the structural integrity of said substrate and to minimize further the changes of damage to said substrate when it is initially installed by pulling the substrate longitudinally into the groove; and

resilient sealing means attached to and projecting outwardly away from said pre-formed central sealing segment, said resilient sealing means effecting engagement with the adjacent surface of said other member to provide a desirably tight, water-and-air-resistant joint between said two members, said resilient sealing means being formed of means to provide relatively low-friction sliding movement between said two members whereby to permit such movement to be produced by hand without significant impediment.

4,064,655
DOOR AND METHOD OF MAKING SAME

Romer G. Weyant, 81 Edgewater Drive, Elkhart, Ind. 46514

Continuation of Ser. No. 623,031, Oct. 16, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,363
Int. Cl.[2] E06B 3/00
U.S. Cl. 49—501 3 Claims



1. A rectangular door having front and rear sheet metal panels in spaced relation, a core portion sandwiched between said sheet metal panels and on which the outer peripheries of said sheet metal panels are mounted, said core portion including wooden members defining the top, bottom and vertical side

edges thereof and thermal sound insulation material retained within the confines of said wooden members and sheet metal panels, said wooden members having rear and front surfaces, the outer peripheries of said sheet metal panels covering the rear and front surfaces of said wooden members and terminating at the outer peripheries of said surfaces, and metallic extrusions defining U-shaped channel members with elastic properties extending around and enclosing in engaged relationship the outer peripheries of said sheet metal panels and the wooden members sandwiched therebetween, each of said channel members having a transverse base and a pair of side walls extending inwardly perpendicular to said base and in parallel relation to define the U-shaped portion of the channel member and having a flange extending outwardly from said transverse base to provide in cooperation with the latter marginal recess for fitting into a door frame, and the channel member enclosing one vertical edge of the core portion extending the full length thereof and being cambered in the transverse direction of said base in an essentially unstressed condition so that it is concave in the rearward direction of the door when the latter is open and so that it is substantially straight in a stressed condition when the door is closed in said door frame, the channel member enclosing the other vertical edge being straight when in an unstressed condition, and a continuous sealing strip secured to the rear surface of said flange for engagement with said door frame

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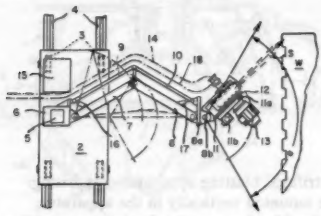
4,064,656

DEVICE FOR BLASTING LARGE AND BULKY WORKPIECES

Johannes Zeidler, Reinbek, Germany, assignor to Alfred Gutmann Gesellschaft fur Maschinenbau, Hamburg, Germany

Filed June 9, 1976, Ser. No. 694,142
Claims priority, application Germany, June 10, 1975, 2525761
Int. Cl.² B24C *3/06*
U.S. Cl. 51—426 **3 Claims**



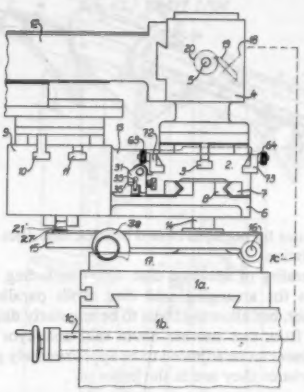
1. Apparatus for blasting particulate material onto workpieces comprising an enclosure within which a workpiece can be positioned, said enclosure having a bottom wall with horizontally disposed rails thereon extending the length of the enclosure, a centrifugal impeller for blasting particulate material onto a workpiece in said enclosure, impeller mounting means including a carriage arranged to travel the length of the enclosure on said rails, motor means mounted on said carriage for driving the carriage on said rails, a vertical column on said carriage, an acticulated arm means pivotally connected at one end to said column for pivotal movement in a horizontal plane and connected at the other end to said centrifugal impeller wheel for supporting the latter, said other end including joints for pivotal movement of said centrifugal impeller about horizontal and vertical axes, said articulated arm means being extensible and contractible for moving the centrifugal impeller laterally away from and toward said column, and means for actuating said articulated arm means and said joints for selectively moving said centrifugal impeller to selected positioning and directing it at selected angles with respect to the workpiece.

4,064,657

MACHINE FOR MACHINING SPIRAL CUTTING EDGES ON CUTTING TOOLS

Robert Habib, 36, Quai Gustave Ador, 1207 Geneva, Switzerland

Filed May 28, 1976, Ser. No. 691,029
Claims priority, application Switzerland, June 6, 1975, 7345/75
Int. Cl.² B24B *19/00*
U.S. Cl. 51—33 W **7 Claims**



1. A machine for machining a spiral cutting edge on a workpiece having an elongate shank with a rounded head, comprising;

a support unit comprising first and second supports mounted for sliding movement relative to one another and for joint rotation about a vertical axis;

a headstock carried by the first support, the headstock having a spindle for carrying thereon and, coaxially with an axis thereof, a workpiece having a rounded head surface and a cylindrical shank surface smoothly continuing the head surface, the headstock being positionable so that in one position of the headstock, the axis of the spindle intersects the vertical axis;

a device mounted on the second support for helicoidally driving the headstock spindle;

a rotary machining tool;

means for mounting the support unit for vertically translational and horizontally rotational movements thereof, the latter being centered about the vertical axis; and means for simultaneously effecting the vertically translational and the horizontally rotational movements to provide a helicoidal movement of the support unit relative to the machining tool;

whereby the machining tool can machine a spiral cutting edge on the workpiece extending over the rounded head surface and smoothly continuing over the cylindrical shank surface of the workpiece, to produce a round-headed machined tool.

4,064,658

BRUSH ROUNDATOR

John E. Bergman, Huntington Bay; William T. Keeler, E. Meadow, and Patrick J. McKenna, West Babylon, all of N.Y., assignors to Blair Tool and Machine Corporation, College Point, N.Y.

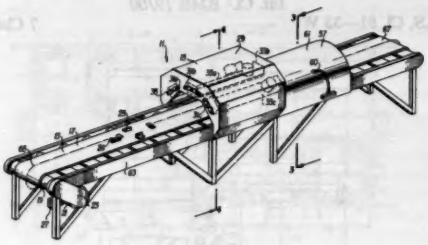
Filed Sept. 9, 1976, Ser. No. 721,726
Int. Cl.² B24B *7/20*
U.S. Cl. 51—110 **12 Claims**

1. A brush roundator for dulling the tips of brush bristles which are mounted on brush backs comprising:

a conveyor for conveying along a straight path said brush

backs having said brush bristles mounted thereon, said conveyor including fastening members for fastening said brush backs to said conveyor with said bristles extending outwardly away from said conveyor;

a plurality of abrasion disc series, each of said abrasion disc series including a plurality of abrasion discs arranged side-by-side, parallel to said conveyor and in the paths of



the outer tip portions of said bristles, said discs having axes of rotation;

said plurality of abrasion disc series including a mounting means for arranging said disc series parallel with one another, but allowing them to be angularly displaceable as units from one another about said conveyor so that the disc axes can be adjusted to be approximately parallel with the bristles they are in the paths of.

4,064,659

APPARATUS FOR CENTERING SHEETS OF GLASS ON THE PLATFORM OF A MACHINE

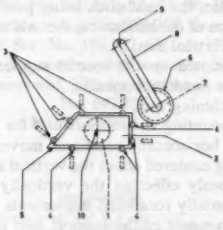
Moreno Ulivi, Pisa, Italy, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Mar. 4, 1976, Ser. No. 664,029

Claims priority, application France, Mar. 4, 1975, 75.06640

Int. Cl.² B24B *19/00*

U.S. Cl. 51—277 **11 Claims**



1. Apparatus for centering sheets of glass and the like on the platform of a machine for finishing the edges or surface of the sheet including a plurality of centering pins movable into contact with the sheet at spaced points on the periphery thereof, and drive mechanism for said pins which comprises a frame, a pin-carrying support carrying at least one of the pins and being mounted on the frame for movement between a rest position situated away from the platform at which the pin is turned down below the plane of the sheet on said platform and a second position situated adjacent said platform wherein the pin and support are moved to an upright position so that the pin engages the edge of the sheet, drive means connected to said support for turning said support and pin to the upright position whenever the support is advanced toward said platform and for retracting the support away from the platform, to thereby turn the pin and the support down to their rest position, guide means for guiding said support during said turning, advancing and retracting movements, and adjustable stop means for limiting the advance of said support toward the platform.

4,064,660

PROCESS FOR PREPARING HAZE FREE SEMICONDUCTOR SURFACES AND SURFACES SO MADE

Ingolf Lampert, Burghausen, Germany, assignor to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Germany

Filed Aug. 17, 1976, Ser. No. 715,031

Claims priority, application Germany, Sept. 1, 1975, 2538855

Int. Cl.² B24B *1/00*

U.S. Cl. 51—283 R **7 Claims**

1. A process for preparing haze free 111-oriented gallium arsenide surfaces by polishing, which comprises subjecting the surfaces to the polishng action of (a) an aqueous suspension containing a polishing agent of the group consisting of quartz, silica, a silicate, a fluosilicate and a mixture thereof, having a pH range from 6–8, in mixture with (b) an aqueous solution of 2–15% by weight of hydrogen peroxide likewise having a pH of 6–8.

4,064,661

CENTRIFUGAL BLASTING APPARATUS

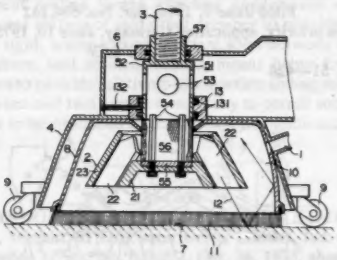
Riichi Maeda, 30-1, Kitakata 2 chome, Ichikawa, Chiba, 272, Japan

Filed Apr. 16, 1976, Ser. No. 677,785

Claims priority, application Japan, Apr. 19, 1975, 50-47849

Int. Cl.² B24C *5/06*

U.S. Cl. 51—424 **9 Claims**



1. A centrifugal blasting apparatus comprising:

a spindle mounted vertically in the apparatus;

a blast wheel having an axis of rotation coinciding with the spindle for rotating with the spindle to blast abrasive particles toward a workpiece; and

means for supplying the blast wheel with the abrasive particles;

said blast wheel comprising a boss and a plurality of vanes fixed to the boss and arranged around the axis of rotation in an equally spaced relation from each other, the vanes each lying in a plane slanting with respect to the axis of rotation at an angle ranging between 25° and 65°, and with respect to an axis perpendicular to the axis of rotation, at an angle ranging between 40° and 80°, the abrasive particles being fed to the top portion of the blast wheel.

4,064,662

COLLAPSIBLE TETRAHEDRAL STRUCTURE

John M. O'Toole, 3771 Las Flores Court, Los Angeles, Calif. 90034

Filed Sept. 29, 1976, Ser. No. 727,960

Int. Cl.² E04B *1/343*

U.S. Cl. 52—71 **18 Claims**

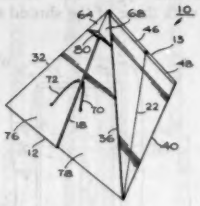
1. A collapsible, rigid lodgment structure comprising:

a generally rectangular rigid blank folded along a first fold

and a second fold, each fold parallel to and spaced approximately one-quarter the longitudinal distance from the rectangle shorter edges, the shorter edges being joined together;

a first bifurcation running diagonally along one substantially quarter blank section defined by the first fold, and a second bifurcation running diagonally along the second quarter blank section defined by the second fold;

a third bifurcation in a center section defined by the first and second folds, the third bifurcation being parallel to the first bifurcation;



a fourth bifurcation in the center section being parallel to the second bifurcation; whereby, when the first and second folds are flattened so that the blank sections adjacent the folds are placed in a common plane, a tetrahedron is defined; and

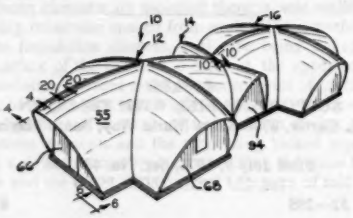
means for joining one-half of one of the blank's longitudinal edge with another half of the same longitudinal edge in a substantially weather proof line; whereby upon said joining a tetrahedron is formed.

4,064,663

SHELTER AND METHOD OF MAKING SAME

Charles W. Moss, Mill St., West Rockport, Maine 04856

Filed May 6, 1976, Ser. No. 683,835
Int. Cl.² E04B *1/32*
U.S. Cl. 52—80 **14 Claims**



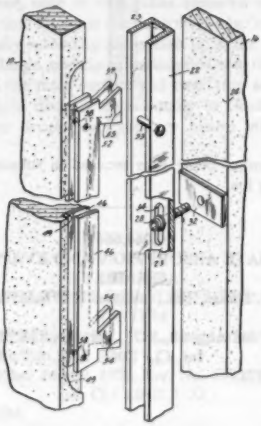
1. A basic shelter module adapted to be used either singly or interconnected with one or more similar modules to form a shelter, comprising a frame mounted on a supporting surface, a flexible fabric cover supported by said frame and defining when distended convex external configurations, a layer of rigid foam material adhered to the outer surface of said cover so as to aid in supporting the distended cover, and a protective waterproof coating adhered to the outer surface of said layer of rigid foam material, said frame including a plurality of relatively rigid arch members arranged to face a common center and rigid base members mounted on the supporting surface so as to define a bottom perimiter of the module, the bottom ends of said rigid arch members being pivotally connected to said base members, said cover being attached at some of its edges to said arch members and attached at the other of its edges of said base members, said frame also including a hub centered between said arch members, and a plurality of relatively rigid transverse members extend respectively between said hub and the apex of each arch member, each of said transverse members including an extension member movably connected therewith and selectively movable to extend and retract the length of said transverse member, said transverse members being extensible to pivot said arch members outwardly to tension said cover during one step of erection of said basic shelter module, each of transverse members being releasable from its associated arch member for optional removal from said module when said rigid foam material has cured following initial application of the foam material onto the cover.

4,064,664

CRYPT STRUCTURE

Michael F. Gaul, 2800 Lake Shore Drive, Chicago, Ill. 60657

Filed Mar. 2, 1977, Ser. No. 773,515
Int. Cl.² E04H *1/04*
U.S. Cl. 52—136 **7 Claims**



1. In a connecting system in a crypt building structure for retaining a plurality of substantially similar slab elements in position on a generally upright grid composed of a plurality of spaced walls, the combination comprising: vertical channel members vertically and forwardly adjustably connected to the edges of the spaced walls; support means attached to adjacent ones of said channel members for supporting each slab element; at least one crypt cover slab; hanger members attached to opposing vertical side walls of said cover slab at the same reference distance from the front surface of the slab; extending rearwardly of the slab to which the hanger member is attached, vertically spaced protruding reference surfaces on said hanger members cooperating with a vertically extending alignment surface of said channel member to thereby reference said front surface of the slab to the channel member, said support means and hanger member providing a pin and sloping ledge surface connection.

4,064,665

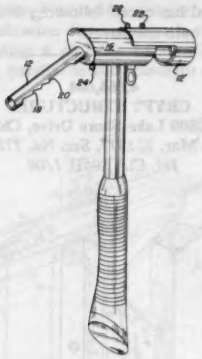
ICE ANCHORING METHOD AND DEVICE

Greg E. Lowe, Ogden, Utah, and Michael R. Lowe, Eldorado Springs, Colo., assignors to Lowe Alpine Systems, Inc., Lafayette, Colo.

Filed July 26, 1976, Ser. No. 708,957
Int. Cl.² E02D *5/74*
U.S. Cl. 52—155 **15 Claims**

1. An ice anchoring device comprising: an elongated member having an at least partially enclosed channel defined therein, the channel being defined with at least two directly opposed walls, the exterior of the member having substantially parallel surfaces in the longitudinal direction, a bevel surface extending substantially inwardly from the exterior of the elongated member at an end thereof to the channel, and a handle connected to the elongated member; whereby, the elongated member may be driven into ice with the bevel surface defining a cutting edge to inwardly fracture the ice between the op-

posed portions of the channel with the fractured ice being removed through the channel, and the exterior surfaces of the



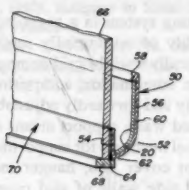
elongated member being thus secured in substantially undisturbed, strong ice.

4,064,666

CONDENSATE ABSORPTION AND EVAPORATION ASSEMBLY

Joe C. Kinlaw, Dallas, Tex., assignor to WindoWik Co., Dallas, Tex.

Filed Aug. 10, 1976, Ser. No. 712,521
Int. Cl.[2] E06B *7/12*
U.S. Cl. 52—171 **16 Claims**



1. A condensate absorption and evaporation assembly comprising:

a trough-shaped frame member disposed subjacent a surface having a flow of condensate, said frame member extending only along that side of the surface having the flow of condensate;

a sheet of absorbent material supported by said frame member, whereby condensate flowing into said frame member is entrained within said frame member and absorbed by and carried upward through the capillary attraction of said absorbent material for the condensate to promote the evaporation of the condensate.

4,064,667

DECORATIVE JAMB STRUCTURE FOR ELEVATOR ENTRANCEWAYS

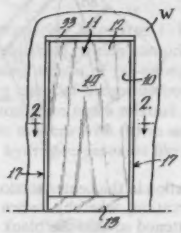
Reuel A. Seaholm, Arkansas City, Kans., assignor to Montgomery Elevator Company, Moline, Ill.

Filed Aug. 6, 1976, Ser. No. 712,332
Int. Cl.[2] E06B *1/04*
U.S. Cl. 52—204 **19 Claims**

1. A decorative jamb for a side of an entranceway that extends through a wall between an elevator hatchway and a building corridor having a floor structure, so that the sides of the entranceway are defined by end surfaces of the wall, there being a top cross structure in the entranceway and a sliding door in the hatchway which normally closes said entranceway, said decorative jamb comprising, in combination:

a shroud structure which has a lower end at the floor structure and an upper end at the top cross structure of the entranceway to conceal the end surface of the wall, said shroud structure having two vertical side elements which are joined by recessed connecting web means to define a vertically extending central channel;

removable insert means including core means and decorative sheath means fixed to said core means, said insert means having lower and upper ends which are substantially coterminous with those of the shroud structure;



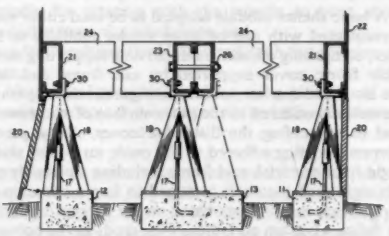
and mounting means detachably securing said removable insert means in said channel with the core means abutting the connecting web means, said mounting means comprising studs fixed to one area of the core means which impale holes in one of the structures, and threaded fasteners in another area of the core means which are captive beneath the decorative sheath means and screw into the connecting web means, there being small holes in the decorative sheath means through which a tool may be inserted to rotate said threaded fasteners.

4,064,668

SUPPORTING PIER WITH TIE-DOWN

Duane L. Carter, 2770 Santa Maria Way, Santa Maria, Calif. 93454

Filed July 9, 1974, Ser. No. 486,748
Int. Cl.[2] E02D *27/32, 35/00*
U.S. Cl. 52—295 **4 Claims**



1. A hold-down support for a building comprising:

a. a foundation having upwardly projecting tension members;

b. a pier supported by the foundation and having a downwardly projecting tension member secured to the pier;

c. a building connected to the pier and supported by the pier;

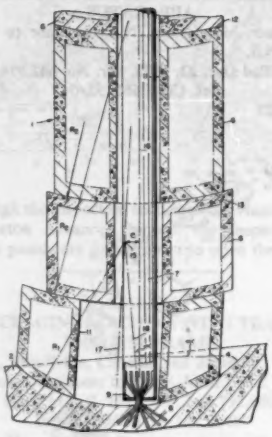
d. and a coupling engaging the foundation tension member and the pier tension member to secure the pier to the foundation and thereby act as a tie-down for the building.

4,064,669

STATIONARY SUPPORTING STRUCTURE

Kjeld Vik, Christian Sindings vei 18, N-1410 Kolbotn, Norway

Continuation of Ser. No. 519,848, Nov. 1, 1974, abandoned. This application Jan. 12, 1976, Ser. No. 648,132
Claims priority, application Norway, May 16, 1973, 732045
Int. Cl.[2] E04C 3/30; E02D 27/42
U.S. Cl. 52—299 13 Claims



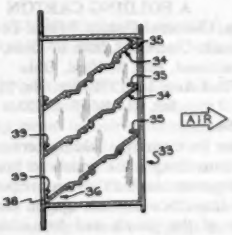
1. Stationary supporting structure comprising at least one column defined by a plurality of annular prefabricated superjacent concrete column elements and vertically central steel tube, said tube having a diameter substantially smaller than the inner diameter of the annular prefabricated column elements to provide a partial linear contact between the tube and the walls of the central aperture of said concrete column elements when said column elements are mounted thereon, said walls and the tube being otherwise spaced from each other, a prefabricated concrete foundation element, said tube being linked to the upper surface of the foundation element, the upper surface of said foundation element and the adjacent ends of each column element having mating minor spherical bearing surfaces allowing disalignment of the axis of said column during erection, said column elements and the tube being locked together to provide a rigid structure by concrete filling the space between the tube and the walls of the central apertures of said column elements.

4,064,670

RAINPROOF LOUVER

Roger A. Lichtenwald, Perrysburg, Ohio, assignor to American Warming and Ventilating Inc., Toledo, Ohio

Filed Oct. 4, 1976, Ser. No. 729,166
Int. Cl.[2] E08B 7/08
U.S. Cl. 52—473 7 Claims



1. In a multiple-blade, substantially rainproof, air flow louver, having a perimeter frame and a plurality of individual, vertically spaced blades extending horizontally across between elements of said frame, and drainage means at at least one end of each of said blades, the improvement consisting of specially configured blades, said blades being positioned with their outer horizontal edges at a level lower than their inner horizontal edges, the main surfaces of said blades extending between said outer and inner edges being interrupted with upward and inward water-flow retarding configurations, the inner-upper edges of said blades having outwardly extending return lips for preventing water flow thereover inwardly thereof, and the outer-lower edges of said blades having water receiving gutter elements communicating with said drainage means at at least one end thereof, each of said gutter elements consisting of a bottom, a vertical flange at the outermost edge of said bottom, and an inwardly extending anti-splash lip at the upper edge of said vertical flange, said lip extending downwardly at an acute angle toward the main surface and overlying said gutter element a sufficient distance substantially to eliminate impingement of water drops from superior blades into said gutter element.

4,064,671

STABILIZER STRUT FOR SUSPENDED CEILING SYSTEM

Gale E. Sauer, Williamsville, N.Y., assignor to Roblin Industries, Inc., Buffalo, N.Y.

Filed June 9, 1976, Ser. No. 694,207
Int. Cl.[2] E04B 5/52
U.S. Cl. 52—696 14 Claims

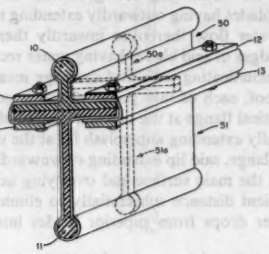
1. In combination with a pair of spaced grid members disposed in a substantially parallel manner with respect to one another, a stabilizer strut for lateral connection between said grid members which form a supporting grid system and the like wherein each grid member includes an upstanding web means surmounted by a bead means extending longitudinally along the upper longitudinal edge of said web means and laterally outwardly of at least one side of said web means, said stabilizer strut comprising:

an elongated body extending between a pair of grid members, said body having a pair of angularly related leg portions at each of its ends in locking engagement with a grid member, each of said pair of leg portions including a pair of aligned slot portions extending inwardly from the non-adjacent, lateral edges of said leg portions wherein only one of said aligned slot portions on each end of said body which correspond to one another includes a locking projection extending beneath said bead means to restrain said strut against vertical uplift with respect to said grid members and the other of said aligned slot portions is of a width so as to be received over said bead means in sufficient lateral engagement therewith to provide stabilized lateral support between a pair of grid members and to maintain said locking projection in place beneath said bead means.

4,064,672
POST-APPLIED WATERSTOP CONNECTION

Robert W. Faid, Westford, and William F. Reinhart, Belmont, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed June 7, 1976, Ser. No. 693,531
Int. Cl.[2] E04C 3/32
U.S. Cl. 52—726 6 Claims

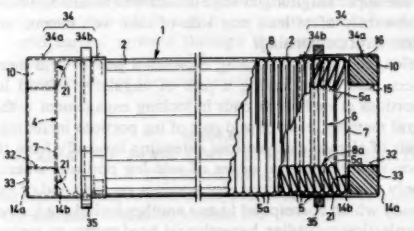


1. A union shell for splicing T-shaped waterstop strips used in a post-applied waterstop assembly, which is made of thin flexible resilient elastomeric material and comprises, in transverse cross-section: (a) two parallel spaced vertical walls joined together at the top by (b) a bulbous tubular portion, each terminated at the bottom by (c) a flat horizontal wing extending away from the base of each said vertical wall, and (d) a relatively short vertical wall attached to the outer edge of each of said horizontal wings and turning downwardly therefrom, said vertical walls defining a longitudinal gap between the terminal ends thereof in order to accommodate said T-shaped waterstop strips, said shell being hollow except for a thin, solid T-shaped baffle centrally located therein having a stem and a base having essentially the same transverse cross-section as the waterstop strips that said shell is designed to splice and being of such dimension and shape so as to fit snugly in the cavity of said shell.

4,064,673
METHOD OF MAKING SHEATHED STICK

Gunter Gerigk, Oberursel; Klaus-Jürgen Bittner, and Armin Köstner, both of Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 586,224, June 12, 1975, Pat. No. 4,013,099. This application Oct. 7, 1976, Ser. No. 730,753
Claims priority, application Germany, Mar. 12, 1975, 2510637
Int. Cl.[2] B65B 5/00
U.S. Cl. 53—3 5 Claims



1. A process for the production of a sheathed, hollow, cylindrical stick composed of a flexible tube folded by longitudinal shirring, which comprises inserting a stick composed of a longitudinally folded tube into a section of a jacket of sufficient length that it projects over both ends of said stick,

sliding annular discs over said projecting portions of said jacket until said jacket presses on the front walls of said stick,

and inverting said projecting portions of said jacket outwardly such that said inverted parts are parallel to and closely adjacent the exterior thereof.

4,064,674
DISC RECORD MANUFACTURING METHOD AND APPARATUS

Leonard Palmer, Morristown, N.J., assignor to Lened, Inc., Elizabeth, N.J.

Filed Dec. 22, 1975, Ser. No. 642,974
Int. Cl.[2] B65B 55/04
U.S. Cl. 53—23 19 Claims

1. In a method for manufacturing a disc record, the steps of pressing, at a press station, a record from a preliminarily formed cake while simultaneously attaching labels to opposed faces of the record and while maintaining the pressed record in a horizontal attitude, with a flash being formed along the periphery of the pressed record at said press station, then transporting the thus-pressed record from said press station to a trimming station whill still maintaining the record at a horizontal attitude, trimming the flash from the record at said trimming station while still maintaining the record at a horizontal attitude, then transporting the thus-trimmed record away from the trimming station to a predetermined location while maintaining the record in a horizontal attitude, then pushing the record along stationary downwardly curved guides to free the record for falling movement under its own weight while simultaneously guiding the record during its falling movement in a manner changing said horizontal attitude into a substantially upright attitude, so that the record while in said substantially upright attitude falls downwardly along a given path, and holding an envelope with an upper open end in the path of falling movement of the substantially upright record so that the record is received in the envelope.

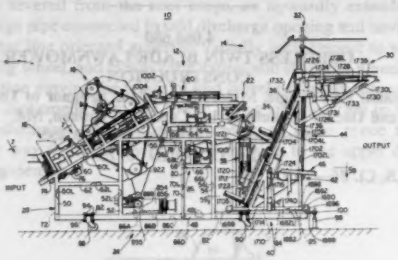
4,064,675
MACHINE FOR OPENING, INSPECTING AND PACKING A FOLDING CARTON

Willis J. Stapp, Clermont County, Miami Township, and Quentin E. Honnert, Cincinnati, both of Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Filed Aug. 16, 1976, Ser. No. 714,562
Int. Cl.[2] B65B 57/00
U.S. Cl. 53—54 10 Claims

8. A machine for opening a folding carton having spaceable panels and means linking the panels to break improper glue spots and to demonstrate that the carton opens properly which comprises an inspection section, carton conveyor means for engaging one of the panels and for advancing the carton through the inspection section, vacuum cup means engageable with another panel, and means for advancing the vaccum cup means in the direction of advance of the carton in timed rela-

tion with the means for advancing the carton through the inspection section, the path of the vaccum cup means diverging from the path of advance of the means for advancing the



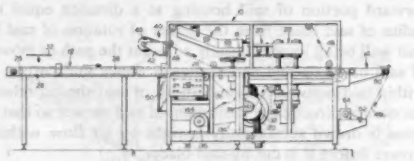
carton through the inspection section as the vacuum cup means and the carton advance through the inspection section, whereby the panels are drawn apart to open the carton.

4,064,676

SKIN PACKAGING MACHINE WITH TRAVELLING VACUUM FRAME

George King, Stouffville, Canada, and James V. Hannon, New Britain, Conn., assignors to Pak-A-Matic, Inc., Berlin, Conn.

Filed May 9, 1977, Ser. No. 795,080
Int. Cl.[2] B65B *57/16, 31/00*
U.S. Cl. 53—77 **16 Claims**



1. In a packaging machine of the type in which a heated film is formed by application of pressure to provide an enclosure for encapsulation of articles disposed on a substrate, the combination comprising:

a. a frame;

b. a conveyor on said frame and including means for advancing substrates between an entrance end and an exit end;

c. a heater disposed above said conveyor at a point intermediate its length;

d. film support and transport means on said frame above said conveyor for advancing film from a point in advance of said heater, under said heater and thence along and adjacent said conveyor;

e. pressure forming means movably supported on said frame for reciprocal movement along said conveyor from adjacent said heater to a point spaced therefrom and including means for forming the heated film by application of pressure;

f. cutting means movably supported on said frame for reciprocal movement along said conveyor adjacent said exit end thereof;

g. drive means synchronously driving said conveyor and film transport means and also said pressure forming means and said cutting means in their movement toward said exit end of said conveyor, said drive means returning said pressure forming means and cutting means in the opposite direction, said drive means further causing said pressure forming means to engage the film to effect forming thereof and causing said cutting means to engage the film to effect severing thereof into units, and said drive means effecting release of the engagement of the forming means and cutting means after movement in the direction of the exit end of said conveyor for reciprocal movement in the opposite direction; and

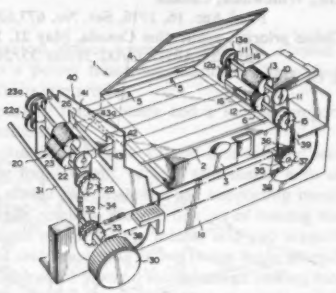
h. control means for operating said drive means to effect engagement and disengagement of said pressure forming means and cutting means and to effect movement of said pressure forming means and cutting means in the direction of said exit end upon engagement and movement in the opposite direction after disengagement.

4,064,677

MICROFILM INSERTER

Yutaka Takahashi; Yoshio Hakamata, both of Tokyo, and Masamitu Konno, Hino, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 18, 1977, Ser. No. 770,041
Claims priority, application Japan, Feb. 20, 1976, 51-17513
Int. Cl.[2] B65B *61/06*
U.S. Cl. 53—123 **8 Claims**



1. A microfilm inserter comprising a table for retaining a microfilm jacket in a fixed position, first feed rolls located at one end of said table for inserting a microfilm strip into an insertion slot in said jacket, second feed rolls located at the other end of said table for further transporting said film strip after it emerges from the exit of said jacket, means for driving said first and second feed rolls, means for detecting the trailing edge of said film strip, and means for cutting off the leading portion of said film strip along the exit of said jacket when the detecting means detects the trailing end of said film strip.

4,064,678

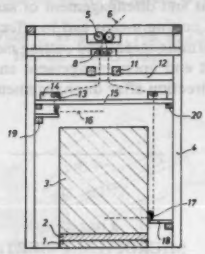
APPARATUS FOR DRAWING A SIDE-FOLDED TUBE OVER PILED OBJECTS

Diethelm Grocke, Nurnberg, Germany, assignor to Nutro Patentverwertungs-und Maschinen-Handels GmbH, Nurnberg, Germany

Filed Nov. 2, 1976, Ser. No. 738,046
Claims priority, application Germany, Nov. 4, 1975, 2549251
Int. Cl.[2] B65B *43/34*
U.S. Cl. 53—183 **8 Claims**

7. Apparatus for drawing a side-folded tube in flatly pressed form from above over objects piled on a base, the tube having two pairs of side-folds, comprising welding and separating means for the side-folded tube, side-fold guiding means for moving apart the side-folds of each pair of folds, said guiding means being formed by four pairs of driven clamping rollers

each associated with and in continuous engagement with a respective side-fold, and tube-engaging devices associated with



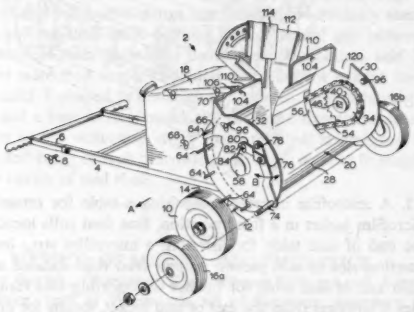
the four side-folds of the tube below said rollers for opening the tube and drawing it down over said piled objects.

4,064,679

COMBINATION LAWN MOWER, SNOW BLOWER AND LAWN SWEEPER

David Spinner, Willowdale, Canada, assignor to Unisette Realty Ltd., Willowdale, Canada

Filed Apr. 16, 1976, Ser. No. 677,631
Claims priority, application Canada, May 21, 1975, 227451
Int. Cl.[2] A01D *53/00, 51/00, 35/24*
U.S. Cl. 56—2 **7 Claims**



1. A multi-use lawn care machine comprising:

a. a tool housing comprising a back plate, a first fixed side plate closing one side of said housing, and a second side plate closing the other side of said housing,

b. a pair of wheels, one mounted on said first side plate and one mounted on said second side plate,

c. a rotary attachment tool in said housing, said attachment tool having a central longitudinal axis of rotation, and first and second ends aligned with said axis,

d. drive means mounted on said first side plate and supporting and driving said first end of said tool, said first end of said tool and said drive means containing co-operating means for transmitting rotary drive motion from said drive means to said tool and for permitting disconnection of said first end of said tool from said drive means in a lateral direction towards said second end,

e. means removably connecting said second side plate to said housing for disconnection of said second side plate from said housing in a laterally outward direction,

f. said second side plate including bearing means aligned with said axis and rotatably supporting said second end of said tool, said bearing means being removable from said second end of said tool in a laterally outward direction to permit said lateral disconnection of said second side plate,

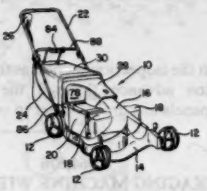
g. and means for applying power to said drive means; whereby said tool may be changed by removing said second side plate, with said second wheel thereon, from said housing in said laterally outward direction and then removing said tool in the same direction from said housing.

4,064,680

CORDLESS TWIN BLADE LAWNMOWER CONSTRUCTION

Donald Earl Fleigle, Middle River, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 8, 1975, Ser. No. 603,250
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—11.9 **4 Claims**



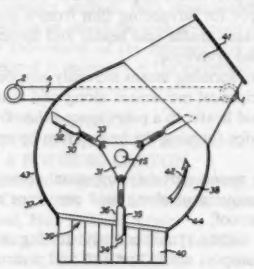
1. In a power lawnmower of the type including a housing and a cutting blade adapted to be rotated in a cutting plane within said housing, the improvement comprising a shroud member within said housing disposed above a part of the path of the outer end of said blade, said shroud comprising a semi-cylindrical vertical wall extending circumferentially within the forward portion of said housing at a distance equal to the radius of said blade from the center of rotation of said blade, said wall being located closely adjacent the path of movement of said blade tip and and vertically above said path; a space within said housing disposed ahead of said shroud relative to the normal direction of movement of said mower so that uncut grass is drawn substantially upright by air flow within said mower before it is cut by said blade.

4,064,681

MACHINE FOR REMOVING FOLIAGE FROM ROOT CROPS

Nils Bertil Glifberg, Staffanstorp, Sweden, assignor to Svenska Sockerfabriks AB, Malmo, Sweden

Filed Aug. 29, 1975, Ser. No. 609,122
Int. Cl.[2] A01D *23/02*
U.S. Cl. 56—121.45 **5 Claims**



1. A machine for removing foliage from root crops, said machine comprising, a stripping wheel having a plurality of approximately radially extending elongated wings having propeller blade-like pitch and supported for rotation about an axis which extends substantially in the direction of travel of the machines, said stripping wheel being disposed in a casing which as viewed in the direction of travel of the machine is open at the front and closed at the rear by a vertical rear wall,

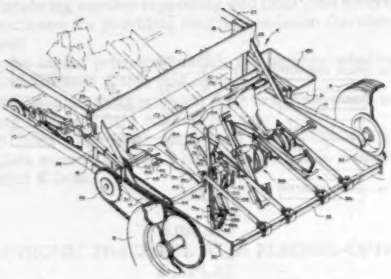
said casing having generally arcuate side walls provided with a lower opening through which the wings of the stripping wheel extend to contact the foliage of the root crops, said side walls having a laterally offset upper discharge opening for the foliage severed from the root crops, an upwardly extending discharge pipe connected to said discharge opening and having its center line oriented generally radially with respect to said stripping wheel, and means for rotating said stripping wheel in a direction moving the wings of said wheel upwardly throughout its movement from the lower casing opening (39) to the upper discharge opening of the casing so as to mvoe the shorter way from the lower casing opening to the upper discharge opening.

4,064,682

MACHINE FOR HARVESTING ASPARAGUS STALKS AND THE LIKE

Spencer Kim Haws, Star Rte., Mesa, Wash. 99343

Filed Aug. 23, 1976, Ser. No. 716,895
Int. Cl.[2] A01D *45/00*
U.S. Cl. 56—327 A **32 Claims**



1. A machine for harvesting crops which grow in stalks or the like comprising

a frame adapted to be moved along the ground, and

a cutting assembly mounted on the frame to selectively rotate downwardly toward the ground to a cutting position adjacent a selected stalk and then upwardly away from the cutting position, said cutting assembly including

a hub means mounted on said frame to selectively rotate about a generally horizontal axis,

first and second arms carried by and extending outwardly of the hub means in a generally side by side relationship,

a cutter element extending generally laterally from the outer end of the first arm for cutting the stalks as the cutting assembly is rotated through the cutting position,

first and second holding pads mounted respectively on said first and second means in a generally face to face relationship,

said hub means being positioned so that as it is rotated the arms move in a generally vertically disposed path, said arms being mounted at the ends thereof to pivot transversely of said path, and

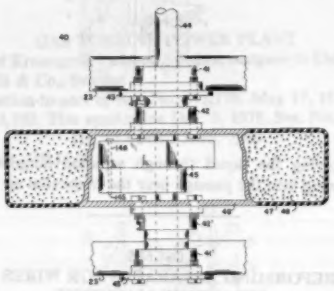
means for causing said arms to move together to cause the holding pads to grasp a stalk therebetween when the cutting assembly rotates to a cutting position and then to carry the stalk upwardly as the cutting assembly rotates upwardly.

4,064,683

CONTINUOUS MECHANIZED HARVESTING OF HORTICULTURAL CROPS

Bernard R. Tennes, Charlotte, and Clyde L. Burton, East Lansing, both of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 14, 1976, Ser. No. 686,423
Int. Cl.[2] A01D *46/00*
U.S. Cl. 56—328 TS **6 Claims**



1. A mechanical shaker assembly apparatus adapted for attachment to a power frame for continuous harvesting of horticultural fruits comprising:

a first supporting frame means and a second supporting frame means;

a shaker unit secured to each of said first and said second supporting frame means, each of said shaker units comprising a shaker pad, a shaker pad supporting means, a motor-driven rotatable shaft, a first set of bearing means and a second set of bearing means, said pad supporting means and said supporting frame means being journalled to said shaft by said first and second sets of bearing means, respectively, said shaker unit further comprising at least one offset inertial weight secured to said shaft for rotation therewith; and

a means secured to said first supporting frame means for forcing each of said shaker unit pads into frictional engagment with the other of said pads, said forcing means equipped with an expansion means to permit passage of plant trunks between said frictionally engaged pads.

4,064,684

FALSE TWISTING UNIT

Jan Nijhuis, Hengelo, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed July 22, 1975, Ser. No. 598,013
Claims priority, application Netherlands, Aug. 21, 1974, 7411139
Int. Cl.[2] D01H *13/30, 7/92;* D02G *1/04*
U.S. Cl. 57—35 **9 Claims**

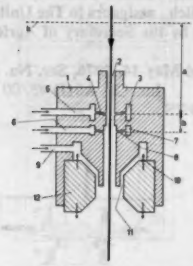
1. A false twister comprising a body having a passage therethrough for passing a strand, said passage having a substantially cylindrical portion surrounded by a first cavity, first channel means for supplying compressed air to said first cavity, said cavity communicating with said portion through tangential air ducts having mouths opening into said portion for producing a rotating air column; a second cavity surrounding said passage; and second channel means comprising said second cavity and liquid ducts communicating from said second cavity tangentially to said passage for supplying liquid to said passage near the mouths of said ducts.

4. A method of applying liquid to a strand, comprising:

a. passing the strand through a passage in a false twister,

b. applying air through tangential air ducts in said false

twister to provide a rotating air column in said passage, and



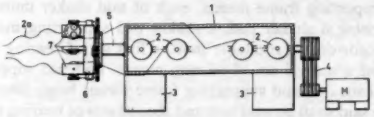
c. applying the liquid through separate tangential ducts opening into the passage near the tangential air ducts.

4,064,685

PREFORMING APPARATUS FOR WIRES IN STRANDING MACHINES

Hans-Joachim Polke, Werdorf, Germany, assignor to W. H. Kuester K.G., Germany

Filed Sept. 22, 1976, Ser. No. 725,458
Claims priority, application Germany, Apr. 28, 1976, 2618586
Int. Cl.[2] D07B *3/00, 7/00*
U.S. Cl. 57—55 13 Claims



1. A preforming apparatus for preforming the wires in a stranding machine, the apparatus comprising:

a. a base plate mountable on said stranding machine to be rotatable about the machine axis;

b. carrier means mounted on said base plate;

c. first and second rollers arranged on each carrier means to be rotatable about axes substantially perpendicular to and spaced from the machine axis, the axis of rotation of at least one of said rollers on each carrier means being adjustable in position relative to the other roller, said carrier means together with said preforming rollers defining individual preforming devices;

d. adjusting drive means mounted on said carrier means for effecting adjustment of said adjustable rollers; and

e. drive means mounted on said base plate and operable to simultaneously operate all said adjusting drive means.

4,064,686

INTERMITTENTLY BULKED YARN

Robert L. Whitted, Rte. 7, N. Parker Road, Greenville, S.C. 29609, and James E. Simmons, Rte. 1, Marietta, S.C. 29661

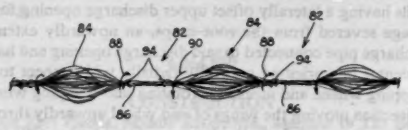
Continuation-in-part of Ser. No. 553,838, Feb. 2, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 655,671
Int. Cl.[2] D02G *3/24, 3/34, 1/16*
U.S. Cl. 57—140 J 3 Claims

1. A bulk yarn formed from a plurality of multifilament yarns comprising:

alternating compact and open segments of yarn;

said compact segments including first and second plaited portions of said multifilament yarns;

said first and second plaited portions being twisted in opposite directions, and



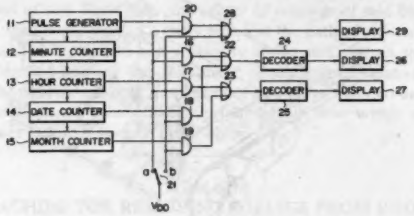
said open segments of said yarn being defined by loosely bundled multifilament yarns having a greater cross-section than said compact segments.

4,064,687

DIGITAL DISPLAY TYPE TIMEPIECE

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1975, Ser. No. 602,112
Claims priority, application Japan, Aug. 10, 1974, 49-91890
Int. Cl.[2] G04B *19/24;* G04C *21/32;* G08B *23/00*
U.S. Cl. 58—4 A 7 Claims



1. A digital display type timepiece comprising:

oscillator means for generating reference signals;

time counting means for counting the reference signals for time display;

means for effecting a date counting by counting carry signals from said time counting means;

means for normally receiving output signals from said time counting means, which signals represent the always changing time, so as to normally effect a time display at a 2-digit decimal numeral figure display section divided in a manner to correspond to an hour and a minute display with a dividing display mark therebetween;

a first control means for visually flashing said dividing display mark at a rate of one cycle per second while said means for normally receiving output signals is effecting the time display;

a manually operable switching means for effecting a switch from a time display to a date display by coupling the output of said date counting means to said decimal display section in place of the output of said time counting means; and

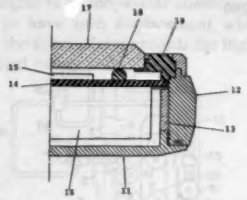
a second control means for switching the complete display mark from its flashing state to another state different from its flashing state during the switching of said manually operable switching means to display the date, so as to visually distinguish between a date display and a time display.

4,064,688

TOUCH SENSITIVE ELECTRODE ASSEMBLY FOR SOLID STATE WRISTWATCHES

Takehiko Sasaki, Yamatokoriyama, and Tsutomu Nakamura, Akashi, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 5, 1976, Ser. No. 664,282
Claims priority, application Japan, Mar. 6, 1975, 50-27861; Mar. 6, 1975, 50-31016[U]
Int. Cl.[2] G04B *19/30*; H01H *35/00*
U.S. Cl. 58—50 R 13 Claims



12. A touch sensitive switch assembly for a solid state wristwatch comprising:

an enclosure of said solid state wristwatch for engagement with the wrist of a wearer, said enclosure comprising electrically conductive material for serving as one electrode of said touch sensitive switch;

a front glass sheet received within said enclosure and having a viewing window therein;

an insulating member supporting said front glass sheet in said enclosure for providing electrical isolation therebetween; and

display means provided beneath the viewing window and accomodated within said enclosure;

said front glass sheet being pervious to light emission emerging from said light emitting display;

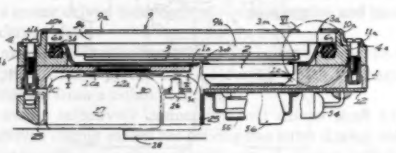
said front glass sheet comprising electrically conductive glass material having a resistivity less than several hundred KΩcm.

4,064,689

ELECTRONIC TIMEPIECE WITH ELECTRO-OPTICAL DISPLAY

Tetsuya Yasuda, Tokyo; Yoshio Iinuma, Higashi-murayama; Yuzo Maekawa, Fuchu; Toshikiyo Kato, Sayami, and Masaru Yoshida, Kodaira, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 490,060, July 19, 1974, abandoned. This application Apr. 7, 1976, Ser. No. 674,842
Claims priority, application Japan, July 20, 1973, 48-85811
Int. Cl.[2] G04B *19/30*
U.S. Cl. 58—50 R 20 Claims



7. An electronic timepiece comprising:

a substrate with substantially parallel front and rear sides;

electro-optical display means adjacent said front side provided with electrode leads for generating a variable time indication;

a first flexible printed sheet overlying said substrate at said front side and carrying a wiring pattern with first conductors contacting said electrode leads;

a second flexible printed sheet overlying said substrate at said rear side and carrying a wiring pattern with second conductors respectively connected to said first conductors;

an electric battery supported on said substrate adjacent said rear side; and

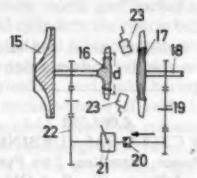
control means in circuit with said battery for selectively energizing said electrode leads by way of said first and second conductors, said control means being supported on said substrate adjacent said rear side through the intermediary of said second printed sheet.

4,064,690

GAS TURBINE POWER PLANT

Sven-Olof Kronogard, Lomma, Sweden, assignor to United Turbine AB & Co., Sweden

Continuation-in-part of Ser. No. 471,176, May 17, 1974, Pat. No. 3,943,703. This application Dec. 5, 1975, Ser. No. 638,052
Int. Cl.[2] F02C *3/10*, *7/02*
U.S. Cl. 60—39.16 R 4 Claims



1. In a gas turbine power plant comprising a compressor, a first turbine rotor mounted upon the same shaft as, and imparting rotary movement to said compressor, at least one further turbine rotor mounted upon a shaft separate from that of the said first turbine rotor and compressor rotor combination, and at least one combustion chamber having fuel supply means, receiving air from the compressor and supplying combustion gas to said first and at least one further turbine rotor, the improvement, that the fuel supply means are adjustable to make the combustion chamber issue gases having temperatures above 1000° C, that at least the vanes of said first turbine rotor are manufactured from ceramic material and that the diameter of said first rotor is smaller than that required to produce the power necessary to drive the compressor, and means for mechanically supplying the additional driving power necessary to provide the total required compressor work, said means including a variable transmission between said further rotor and said first turbine rotor.

4,064,691

COOLING OF FASTENER MEANS FOR A REMOVABLE FLAMEHOLDER

Dudley O. Nash, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Nov. 4, 1975, Ser. No. 628,749
Int. Cl.[2] F02C *7/22*
U.S. Cl. 60—39.06 7 Claims

1. A flameholder apparatus for disposition within a combustible gas stream comprising:

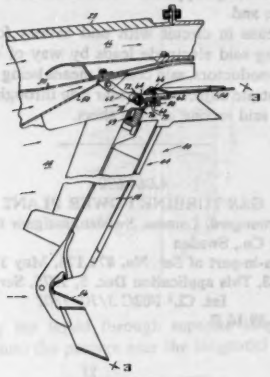
a gutter for holding a flame;

a heat shield disposed within said gutter and upon a surface thereof, said heat shield forming a cavity having a cooling aperture through said gutter in communication with, and generally aligned with, the upstream gas stream; and

means for fastening said gutter to a support member, said fastening means being partially recessed within said heat shield cavity; wherein

said fastening means is cooled by a portion of the gas stream passing through said cooling aperture; and

the size of said cavity and the size of said cooling aperture are such that the velocity of the cooling portion passing



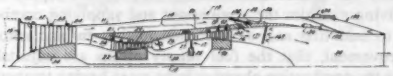
between said fastening means and said heat shield is at least as great as the flame propagation velocity.

4,064,692

VARIABLE CYCLE GAS TURBINE ENGINES

James Edward Johnson, Hamilton; Tom Foster, and Roy Duncan Allan, both of Cincinnati, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 2, 1975, Ser. No. 583,056
Int. Cl.[2] F02K *3/06, 1/12*
U.S. Cl. 60—261 **11 Claims**



1. A gas turbine engine comprising:

an inner nacelle circumscribing a core engine, low pressure turbine and afterburner in respective serial flow relation wherein the inner nacelle extends downstream of the afterburner to define an inner nozzle for exhausting the core engine gas flow;

an outer nacelle circumscribing the inner nacelle and spaced apart therefrom to form an outer bypass duct around the core engine and wherein the outer nacelle extends upstream of the inner nacelle to form an inlet for the engine and downstream of the inner nozzle to form an outer nozzle for exhausting the bypass and core engine gas flows;

a fan disposed in the inlet upstream of the core engine and driven by the low pressure turbine for compressing inlet gas flow to the bypass duct and core engine;

flow passage means disposed through the inner nacelle intermediate the low pressure turbine and afterburner for injecting the bypass duct flow into the core engine exhaust such that the combined flows are directed through the afterburner;

valve means for selectively obtruding and unobtruding the flow passage means whereby the engine may be operated as a high bypass turbofan when said flow passage means is obtruded and as low bypass mixed flow augmented turbojet when said flow passage means is unobtruded, and

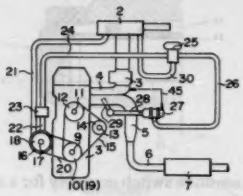
flap means pivotally hinged to the downstream end of the inner nacelle for simultaneously varying the area of the inner exhaust nozzle and the exhaust area of the other bypass duct, wherein the flap means is movable to a position to abut the outer nacelle such that gas flow through the outer bypass duct is obtruded.

4,064,693

SECONDARY AIR SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES

Norio Shibata, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 4, 1976, Ser. No. 693,126
Claims priority, application Japan, Feb. 24, 1976, 51-19186
Int. Cl.[2] F02B *75/10*; F01N *3/10*
U.S. Cl. 60—290 **8 Claims**



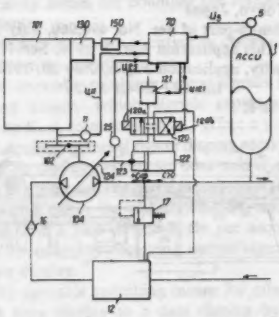
1. A secondary air supply system for an internal combustion engine comprising a passage means for conducting secondary air to the exhaust system of the engine, and a check valve provided in the midst of said passage means for allowing air to flow only toward said exhaust system, said check valve comprising a valve element which opens the valve when air pressure difference above a predetermined level exists across the valve and a control means which controls said predetermined level in accordance with intake air flow rate of the engine in a manner to lower said level as the intake air flow rate increases.

4,064,694

CHARGING AN ACCUMULATOR BY A HEAT ENGINE

Patrice Baudoin, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Nov. 4, 1976, Ser. No. 738,958
Claims priority, application France, Nov. 6, 1975, 75.33909
Int. Cl.[2] F15B *1/02*; F16H *39/46*
U.S. Cl. 60—413 **9 Claims**



1. A method of regulating the pressure in an accumulator to obtain a pressure therein which lies between two predetermined values using a variable-displacement pump driven by an internal combustion engine to charge the accumulator, the method comprising the following steps:

sensing and generating a signal representative of the pressure within the accumulator;

placing the engine in an operable condition when the sensed

pressure drops to a value below the lower of the two predetermined values and adjusting the pump to have a negative displacement so that it operates as a motor driven by fluid under pressure from the accumulator thereby driving the engine until the engine reaches a speed at which it is self-sustaining;

increasing the displacement of the pump until it reaches a positive value after the engine has reached the self-sustaining speed thereby loading the engine;

controlling the displacement of the pump to maintain the speed of the engine at or about a predetermined value; and

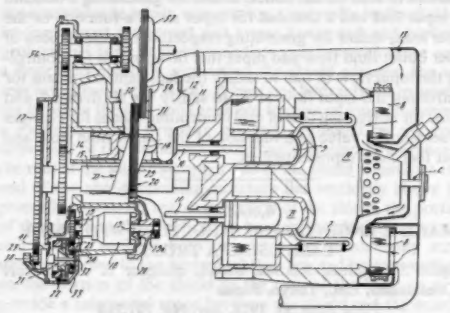
placing the engine in an inoperable condition and adjusting the pump to have zero displacement when the sensed pressure in the accumulator exceeds the higher of the two predetermined values.

4,064,695

STARTER/BLOWER MOTOR

John E. Bradley, Inkster, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1976, Ser. No. 753,346
Int. Cl.² F02G *1/04*
U.S. Cl. 60—517 **4 Claims**



1. A drive system for a Stirling engine having an external heating circuit with a compressor for injecting air thereinto, and a thermodynamic cycling system for converting energy derived from said heating circuit into mechanical motion and for extracting work energy by way of a driven output means, said drive system comprising:

a. a motor driven independently of said engine and having a driven shaft,

b. means drivingly connecting said driven shaft to the compressor for a period of time during which the engine is started from a cold condition,

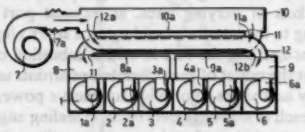
c. means selectively connecting said driven shaft to said driven output means for driving the latter during only an intermediate portion of said period during which the engine is started from a cold condition, said selectively connecting means having intermeshable gear elements relatively movable for interrupting the selectively connecting means, said selectively collecting means having a gradually engagable friction coupling for interrupting drive through said selectively connecting means, and said selectively connecting means further having an actuator effective to sequentially first establish intermeshing of said gear elements and secondly establish drive engagement through said friction coupling.

4,064,696

LIVE-GAS CONDUIT SYSTEM FOR TURBOCHARGED SIX-CYLINDER ENGINES

Gyula Cser, Budapest, Hungary, assignor to Autoipari Kutato Intezet, Budapest, Hungary

Filed May 11, 1976, Ser. No. 685,366
Claims priority, application Hungary, May 13, 1975, CE 339
Int. Cl.² F02B *37/04*
U.S. Cl. 60—598 **9 Claims**



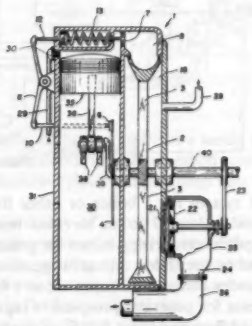
1. A multi-space live-gas conduit system for six-cylinder, serially arranged internal-combustion piston engines, said cylinders having suction inlets, and including a turbocharger associated with said cylinders; the system being linked between said suction inlets and said tubrocharger, and comprising: two separate resonance tanks, each attached to said suction inlets of three adjoining cylinders, said tanks having a volume larger than half of the stroke volume of said three cylinders but smaller than the tenfold thereof; a resonance tube for each tank, adjoining outlet openings of the latter, and having lengths of their center lines which are at least eight times that of the diameter of a circle having the cross-section of said tubes; and a damping tank that links inlet openings of said tubes with the pressure side of said turbocharger; said tubes respectively interconnecting said resonance tanks with said damping tank; said tanks and said tubes being all successively disposed along the longitudinal axis of the engine; wherein the characteristic longitudinal extensions of said tanks and of said tubes all have the same direction; and further comprising a connection from each resonance tube that opens into one of said resonance tanks that is farther away from the respective inlet opening of said tube.

4,064,697

ROTARY ENGINE

Michael Torquato, 2425 Edgebrook Ave., Pittsburgh, Pa. 15226

Continuation-in-part of Ser. No. 531,678, Dec. 11, 1974, abandoned. This application Aug. 13, 1976, Ser. No. 714,112
Int. Cl.² F02G *3/00*; F02C *5/06*
U.S. Cl. 60—624 **2 Claims**



1. A rotary engine comprising a rotor driven by at least three radially extending pistons reciprocating in corresponding stationary cylinders, said pistons being connected by crank arms to a rotor shaft, each cylinder being supplied by fuel and air from a carburetor through a one-way valve, a stator having a

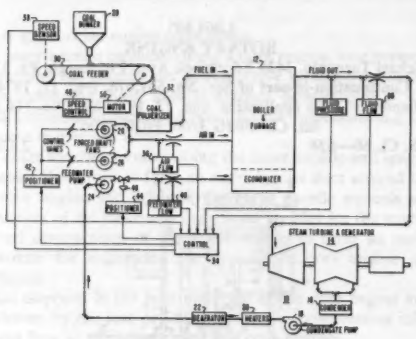
corresponding number of peripherally spaced combustion chambers located adjacent the radially outward extremities of the cylinders, one combustion chamber for each cylinder each combustion chamber including an inlet valve located at the extremity of the associated cylinder, cam means mounted on said rotor, means for adjusting the position of said cam means about the axis of said rotor, means mounted on said stator and operated by said cam means to open each valve upon each rotation of said rotor, a plurality of peripherally disposed vanes of progressively decreasing size on the periphery of said rotor defining pockets of varying sizes, an exhaust port in each pocket leading to the interior of said rotor, a spark plug at each inlet valve for igniting the fuel in said combustion chambers each time that the outlet of each chamber confronts said pockets defined by said vanes to provide successive power thrusts, the outlet of each of said chambers being in sealing engagement with the outermost tips of said vanes, a partition forming a separate enclosure for a portion of said rotor in said stator, and an exhaust fan in said separate enclosure which is driven by said rotor shaft for drawing exhaust fumes from the interior of said separate enclosure and expelling them to the surrounding atmosphere and including a catalyst in the intake portion of said fan.

4,064,698

BOILER CONTROL HAVING A HEATING VALUE COMPUTER AND PROVIDING IMPROVED OPERATION WITH FUELS HAVING VARIABLE HEATING VALUES

Louis P. Stern, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 3, 1976, Ser. No. 720,329
Int. Cl.[2] F01K *13/00*
U.S. Cl. 60—664 **7 Claims**



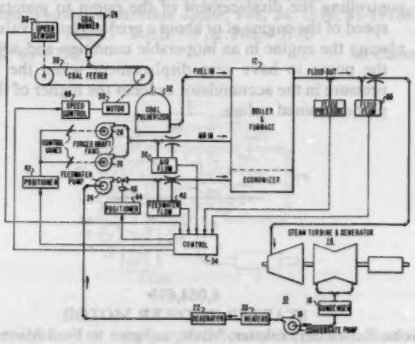
1. A control system for a boiler or other fluid heaters in which inlet fluid is heated to an elevated temperature and pressure, said system comprising means for generating a representation of load on the boiler, means for generating a demand for input fuel and a demand for input air as a function of the boiler load, means for generating respective representations of boiler outlet fluid flow and input fuel flow, means for generating a heat balance ratio of the outlet fluid flow and input fuel flow representations, means for controlling the input flow of fuel to satisfy the fuel demand, means for controlling the input flow of air to satisfy the air demand, and means for correcting one of said controlling means for changes in fuel heating value as a function of the heat balance ratio.

4,064,699

BOILER CONTROL PROVIDING IMPROVED OPERATION WITH FUELS HAVING VARIABLE HEATING VALUES

Lyle F. Martz, Penn Hills, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 3, 1976, Ser. No. 720,328
Int. Cl.[2] F01K *13/00*
U.S. Cl. 60—664 **15 Claims**



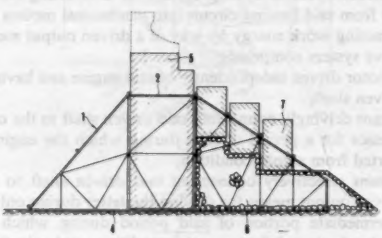
1. A control system for a boiler or other fluid heater in which inlet fluid is heated to an elevated temperature and pressure, said system comprising means for generating a representation of load on the boiler, means for generating a demand for input fuel and a demand for input air as a function of the boiler load, means for generating respective representations of boiler outlet fluid flow and input fuel flow, means for controlling the input flow of fuel to satisfy the fuel demand, means for controlling the input flow of air to satisfy the air demand, and means for correcting one of said controlling means for changes in fuel heating value as a function of the outlet fluid flow and input fuel flow representations.

4,064,700

MARINE ENGINEERING STRUCTURE WITH WIDE BASE USING A TRUSS

Shigeru Sameshima, Kikuna, Japan, assignor to Japan Port Consultants, Ltd., Tokyo, Japan

Filed June 30, 1976, Ser. No. 701,218
Claims priority, application Japan, Aug. 7, 1975, 50-96174
Int. Cl.[2] E02B *3/06*; E02D *27/00*
U.S. Cl. 61—4 **6 Claims**



1. A marine engineering structure, such as a revetment, a breakwater or a quay wall, comprising at vertically extending truss structure having a horizontally arranged base at the lower end thereof, said truss structure comprising a plurality of vertically extending open-sided trusses spaced laterally apart, a plurality of interconnecting members joined to and extending between said trusses, said trusses and said interconnecting members dividing the interior of said truss structures into a plurality of vertically extending multi-sided open spaces ex-

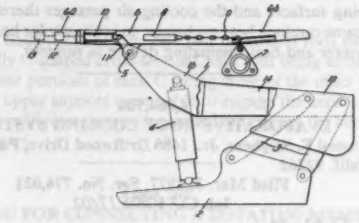
tending upwardly above the base of said truss structure, a floor slab fixed to the base of said truss structure and extending transversely of the lower ends of said vertically extending open spaces, and at least one vertically extending prefabricated main body located within one of said open spaces and extending vertically upwardly from said floor slab, and said main body comprising a unitary block-like structure.

4,064,701

HYDRAULIC SHIELD ASSEMBLY

Hans-Otto Friedrichs, Wuppertal, Germany, assignor to Herman Hemscheidt Maschinenfabrik, Wuppertal, Germany

Filed Oct. 15, 1976, Ser. No. 732,705
Claims priority, application Germany, Oct. 16, 1975, 2546276
Int. Cl.[2] E21D *15/44*
U.S. Cl. 61—45 D 4 Claims



1. An hydraulic shield assembly for use in material-discharging operations in mines, comprising: a generally inclined shield having a front upper end and a rear lower end and having a pronounced bend at an intermediate part between those ends, a floor skid pivotally supporting the shield adjacent the said rear lower end of the shield, at least one hydraulic prop extending between the skid and the shield to raise or lower the shield, a roof-supporting structure pivotally mounted on the front upper end of the shield and extending a substantial distance to the rear of the said front upper end of the shield whereby a rear end of the roof-supporting structure lies vertically above the pivotally-supported rear-end portion of the shield, the portion of the shield to the front of the bend in the shield having top and bottom surfaces both of which are substantially more steeply inclined to the horizontal than top and bottom surfaces on the portion of the shield to the rear of the bend so as to provide a substantial space between the shield and the overlying rear portion of the roof-supporting structure at all positions of the shield, and a pipe for the discharge of material supported in that space by the roof-supporting structure.

4,064,702

APPARATUS FOR MAINTAINING AXIAL ALIGNMENT BETWEEN A DROP HAMMER AND A DRIVEN PILE

Joost W. Jansz, The Hague, Netherlands, assignor to Hollandsche Beton Groep N. V., Rijswijk, Netherlands

Filed Apr. 30, 1976, Ser. No. 681,935
Claims priority, application Netherlands, Dec. 9, 1975, 7514331
Int. Cl.[2] E02D *7/00*
U.S. Cl. 61—53.5 3 Claims

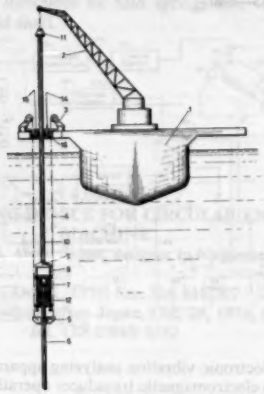
1. In an apparatus used in deep water pile driving having a pile lowered and driven into the seabed, the improvement comprising:

a. a rigid frame,

b. a drop-hammer mounted on the frame for vertical reciprocating movement,

c. rigid suspension means rigidly coupling the frame to hoisting means on a surface vessel and formed by a single member extending upwardly from the rigid frame,

d. a guide sleeve on the lower end of the drop-hammer, said guide sleve having a funnel-shaped mouth opening to receive the fit over the head of a pile to be driven into the seabed, whereby the rigidity of the frame and suspension means and the insertion of the pile head within the guide sleeve combine to maintain the pile in a vertical position during driving and to resist any tipping or tilting at the pile head, drop-hammer interface, and



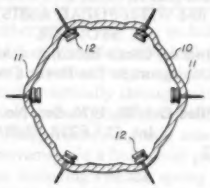
e. a crossbar secured to the pile and cable means connecting the crossbar to winch means on the surface vessel, and means guiding the frame on the cable means.

4,064,703

METHODS AND GUN FOR ANCHORING PILES AND FOR TEMPORARILY INTERCONNECTING TWO CYLINDERS UNDERWATER

Ivo C. Pogonowski, Blacksburg, Va., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,367
Int. Cl.[2] E02D *5/56*
U.S. Cl. 61—53.68 7 Claims



1. A method for anchoring a pile in a sandy soil strata and other granular soils comprising the method steps of,

a. driving a hollow cylindrical pile deep into the sandy soil strata,

b. forming a plurality of outwardly extending bumps in a horizontal plane around the periphery of the hollow cylindrical pile for packing the sandy soil strata around the bump by driving a plurality of headed spikes radially outwardly in the horizontal plane,

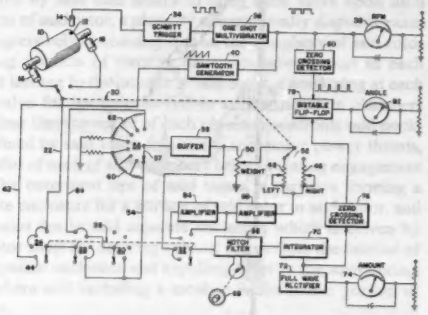
c. penetrating each bump with a spike as the spikes are pressed outwardly further after forming the bump, and

d. lodging each spike in the packed sandy soil strata of its respective bump with only the spike heads remaining in the hollow pile for increasing the load-carrying capacity and for increasing the resistance to pullout of the pile in the sandy soil strata and other granular soils.

4,064,704
VIBRATION ANALYZING APPARATUS

Bobby J. Blackburn, Columbus, Ohio, assignor to IRD Mechanalysis, Inc., Columbus, Ohio

Filed Dec. 5, 1975, Ser. No. 637,892
Int. Cl.[2] G01H 3/10
U.S. Cl. 73—660 2 Claims

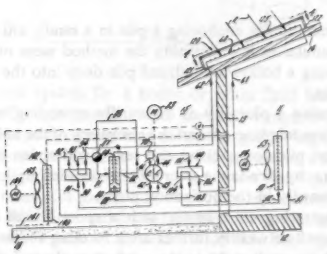


1. In electronic vibration analyzing apparatus, the combination of an electromagnetic transducer operatively connected to a rotating body to be balanced and adapted to produce a displacement signal having an amplitude and phase dependent upon the amount and location of unbalance in a rotating body, means for modifying said displacement signal as a function of the weight of said rotating body and the radius from the longitudinal axis of the rotating body at which a weight is added to balance the same, means for producing a pulsed signal in which the frequency of the pulses is proportional to the rotational speed of said rotating body, phase determining means including zero crossing detectors and a readout meter responsive to said pulsed signal and to said displacement signal for indicating on said readout meter the phase displacement of a point of unbalance on said rotating body with respect to a fixed point on the body, and an amount indicating means responsive to said displacement signal after modification for indicating the amount of unbalance in said rotating body.

4,064,705
AIR CONDITIONING SYSTEM HAVING COMPRESSOR-EXPANDER IN PRESSURIZED CLOSED LOOP SYSTEM WITH SOLAR ASSIST AND THERMAL STORAGE

Thomas C. Edwards, Cocoa Beach, and Amir L. Ecker, Cocoa, both of Fla., assignors to The Rovac Corporation, Rockledge, Fla.

Filed Oct. 26, 1976, Ser. No. 733,751
Int. Cl.[2] F25B 13/00
U.S. Cl. 62—2 15 Claims

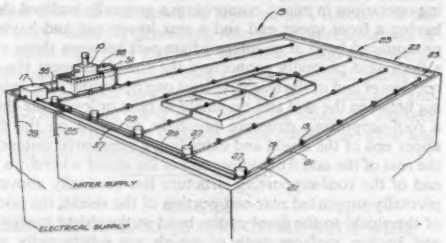


1. In an air conditioning system for an enclosed space the combination comprising a compressor having an inlet port and an outlet port, an expander having an inlet port and an outlet port, the compressor and expander having rotor means coupled together and including vanes for positive compression and expansion as the rotor means is driven, and indoor heat exchanger in the enclosed space, an outdoor heat exchanger in the ambient atmosphere, one of the heat exchangers being connected in primary position between the compressor outlet port and the expander inlet port and the other heat exchanger being connected in secondary position between the expander outlet port and the compressor inlet port to complete a closed loop having a charge of air, valve means for effectively interchanging the connections of the heat exchangers thereby permitting the indoor heat exchanger to be employed for warming in winter and for cooling in summer, the outdoor heat exchanger being in the form of a solar panel having an air conduit and having heat absorbing surfaces thermally coupled to the conduit for warming the conduit by solar radiation, the panel having means defining cooling air passages thermally coupled to the conduit for cooling the conduit by flow of ambient air, and means for alternatively abling and disabling the heat absorbing surfaces and the cooling air passages thereby causing the same outdoor heat exchanger to act as a solar heat absorber in winter and heat dissipating device in summer.

4,064,706
EVAPORATIVE ROOF COOLING SYSTEM

Raymond E. Stephens, Jr., 1486 Driftwood Drive, Palm Springs, Calif. 92262

Filed Mar. 3, 1977, Ser. No. 774,031
Int. Cl.[2] F25D 17/02
U.S. Cl. 62—64 16 Claims



1. A control switch for evaporative roof cooling systems which spray a thin film of water onto the surface of a roof, comprising:

a pair of spaced electrodes located on a sample surface;

means for applying conductive water to said sample surface each time water is sprayed onto the surface of the roof;

electrical connection means for impressing a voltage differential between said electrodes; and

means for sensing current flow resulting from the presence of water between the electrodes, and actuating said cooling system when said current flow ceases.

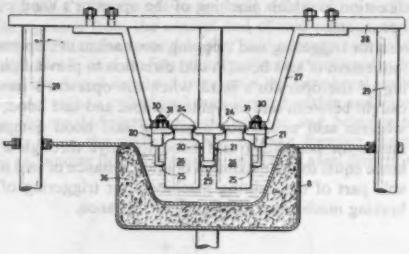
4,064,707
APPARATUS FOR PRE-FREEZING SUBSTANCES OF PRODUCTS INTENDED TO BE PRE-FREEZED

Mario Connizzoli, Via XX Settembre, 40, Brembio (Milan); Camillo Peviani, Vicolo Barni, 6, Lodi (Milan), and Francesca Maietti, Via Raffaello 15, Casalpusterlengo (Milan), all of Italy

Division of Ser. No. 451,273, March 14, 1974, abandoned. This application Mar. 12, 1976, Ser. No. 666,504
Int. Cl.[2] F25D 17/02
U.S. Cl. 62—374 4 Claims

1. An apparatus for prefreezing substances or products intended to be freeze-dried, comprising in combination: a feeding means for feeding one at a time in row-like succession a plurality of containers to a metering station, said containers having a neck and a body, a metering means for introducing in each

container a predetermined amount of substance or product, a tube adapted to contain a refrigerating fluid bath, a guiding and suspension means for the containers while they are being passed through said bath and thrust means to cause the containers to be advanced through the bath, said suspension and guiding means comprising at least one pair of parallel rods having substantially C-shaped cross-sections, said rods being arranged with the bent portions of each C facing those of the other C so as to form upper support means able to engage the neck of the containers and lower support means able to engage the body of the containers.

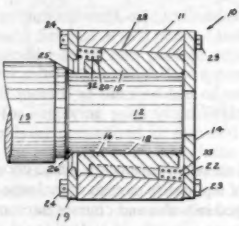


4,064,708

COUPLING FOR CONNECTING A ROTATING MEMBER TO A SHAFT

Eugene H. Breads, Westfield, N.Y., assignor to Renold Ajax Inc., Westfield, N.Y.

Filed May 13, 1976, Ser. No. 686,128
Int. Cl.[2] B25G 3/00, 3/20
U.S. Cl. 64—1 V **6 Claims**



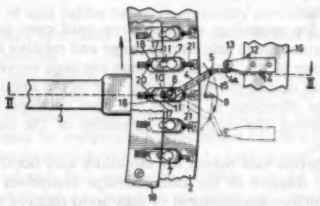
1. A coupling comprising, a sleeve adapted to connect a rotating member to a shaft,
said sleeve having an axial bore therein,
said axial bore receiving an end of said shaft,
a thrust plate attached to an end of said sleeve remote from said shaft,
at least two circumferentially-spaced keyways in said coupling extending through said sleeve from one end thereof to the other end,
a wedge-shaped key in each said keyway,
said shaft having two diametrically-opposed, axially-extending surfaces thereon,
surfaces of said keys adjacent said shaft slidably engaging said surfaces of said shaft,
said keyways being deeper at the ends thereof adjacent said springs whereby said wedge-shaped keys are urged toward the shallower end of said keyways,
a retaining ring fixed to the end of said coupling adjacent said shaft, and a thrust plate fixed to the end of said sleeve opposite said retaining ring,
a bore in said first key,
a spring in said bore in said first key engaging said retaining ring, urging said first key to slide toward said thrust ring,
a second bore in the end of said second key adjacent said thrust ring,
a second spring in said second bore,
said second spring engaging said first key and said thrust ring, urging said second key to slide toward said retaining ring whereby said first key and said second key are urged in opposite directions by said springs and toward the center of said shaft.

4,064,709

WRAP FEEDING DEVICE FOR CIRCULAR KNITTING MACHINE

Teishichi Hayashi, Aichi, Japan, assignor to Nichimen Co., Ltd., Osaka, Japan

Filed Oct. 1, 1975, Ser. No. 618,707
Claims priority, application Japan, Oct. 24, 1974, 49-122672
Int. Cl.[2] D04B 9/32
U.S. Cl. 66—135 **7 Claims**



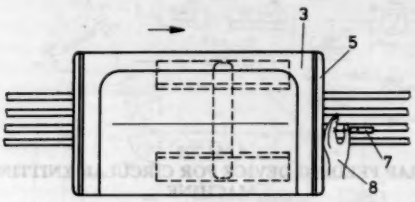
1. A wrap feeding device for circular knitting machines, having a vertical needle, comprising:
a support ring having a cavity formed therein;
a rotatable cylinder disposed beneath said support ring concentrically therewith;
yarn guide means, including a movable block having first and second recesses mounted in said cavity of said support ring for adjustable movement therein radially of said support ring, an arm one end of said arm including a tubular portion received within said first recess of said block, and the other end of said arm including an angled portion in the form of a dog-leg, said angled portion having a hole forming a yarn passage, said yarn passage extending substantially vertically through said other end at said angled portion, screw means fitted within said tubular portion and pivotably connecting said arm to said movable block for movement in a horizontal plane;
return spring means, including a helical spring fitting around said tubular portion in said first recess and comprising a lower end fixed to said tubular portion, and an upper end received in said second recess to act on said yarn guide and bias said arm in the direction of rotation of said cylinder;
abutting means disposed in a path of movement of said dog-leg of said yarn guide for contacting thereof to cause the yarn guide to move against said return spring means and to lap a wrap yarn thereon around the vertical needle over the front half circumference of the needle;
a helical spring held in position by said support ring and urging said block toward said abutment means; and
an adjustable locking screw received in said support ring and bearing on said block on a side opposite to said helical spring cooperating therewith, to permit displacement of said block radially of said support ring, thereby varying the stroke of said arm.

4,064,710

SAFETY DEVICE FOR KNITTING MACHINE

Erich Krause, Bopfingen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed Oct. 5, 1976, Ser. No. 729,626
Claims priority, application Germany, Oct. 10, 1975, 2545558
Int. Cl.[2] D04B *35/10*
U.S. Cl. 66—157 7 Claims



1. In a knitting machine including a stopping mechanism which can be triggered in the event of danger to terminate machine operation, cam carriage movable on said machine, and a hood in the zone of movement in which the cam carriage moves for protecting the machine operator, the improvement comprising:

means for mounting said hood on said cam carriage for movement with said cam carriage and relative to said cam carriage in the direction of cam carriage movement, and

a contact device mounted to the face of the hood as viewed in the direction in which the cam carriage travels for triggering the stopping mechanism of the knitting machine,

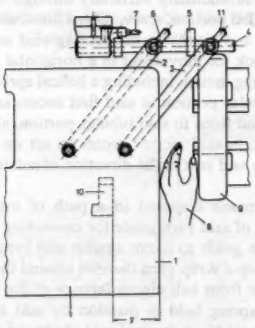
and wherein said means for mounting said hood for movement relative to the cam carriage comprises means for permitting displacement of said hood relative to said cam carriage through a distance corresponding to the braking distance of the cam carriage after the stopping mechanism has been triggered.

4,064,711

SAFETY STOPPING DEVICE FOR KNITTING MACHINE

Erich Krause, and Hans Schieber, both of Bopfingen, Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed Oct. 5, 1976, Ser. No. 729,629
Claims priority, application Germany, Oct. 10, 1975, 2545560
Int. Cl.[2] D04B *35/10*
U.S. Cl. 66—157 5 Claims



1. In a knitting machine having a stationary part and a movable part mounted for movement relative to the stationary part and being driven in a direction which could cause pinching of the operator's hand between the movable part and the stationary part and having a stopping mechanism which may be triggered to terminate movement of the movable part in the event of danger and a hood covering the stationary part, the improvement comprising:

means for mounting said hood on said machine in a position extending across the stationary part and between the stationary part and the movable part for movement in the direction in which pinching of the operator's hand could occur, and

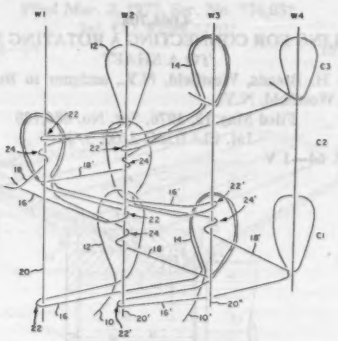
means for triggering said stopping mechanism in response to movement of said hood in said direction to prevent pinching of the operator's hand when the operator's hand is caught between said movable member and said hood, and wherein said means for mounting said hood comprises means for permitting said hood to move through a distance equal to the maximum braking distance of said movable part of the knitting machine after triggering of the braking mechanism plus a reserve distance.

4,064,712

WARP KNIT PRODUCT AND PROCESS

James Franklin Sayre, and Karl Harvey Smale, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 21, 1977, Ser. No. 760,936
Int. Cl.[2] D04B *23/08, 23/10*
U.S. Cl. 66—192 9 Claims



1. A warp-knit two-way stretch fabric comprising a ground construction of a plurality of ends of inelastic yarn knitted into stitches arranged in wales and courses interconnected by diagonal underlap segments of said inelastic yarn and a plurality of ends of elastic yarn laid into said ground construction,

a. each end of said inelastic yarn having in each of said courses a pair of loop segments in adjacent wales of said wales and a segment interconnecting said pair of loop segments,

b. each of said stitches having loops of two ends of said inelastic yarn, and

c. each end of said elastic yarn being substantially parallel to said wales of said ground construction and being covered in each course thereof by a full wrap of one of said underlap segments and a half wrap of an interconnecting segment of said inelastic yarn.

4,064,713

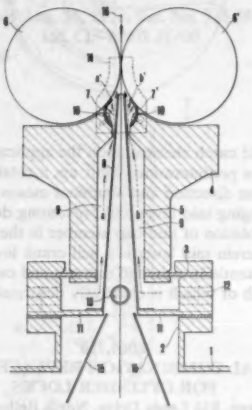
SEAL DEVICE FOR A HIGH PRESSURE STEAMER

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Japan

Filed Aug. 23, 1976, Ser. No. 717,012
Claims priority, application Japan, Sept. 8, 1975, 50-123574[U]; May 19, 1976, 51-57614; May 19, 1976, 51-57616
Int. Cl.[2] D06B *23/18*
U.S. Cl. 68—5 E 1 Claim

1. A seal device for a high pressure steamer comprising a seal

block forming an axially elongated passage and arranged to be mounted on one of the inlet to or outlet from the drum body of a high pressure steamer, said passage having a first end opening to the drum body and second end spaced outwardly from the drum body, a pair of rubber seal rolls located at the second end of said passage and disposed in pressed contact with one another forming a nip therebetween, said rolls forming a closure for the opening from the second end of said passage, sealing plates located at the second end of said passage and fixed to said seal block, said sealing plate projecting outwardly from said seal block and arranged to contact the peripheral surfaces of said seal rolls, a cylindrical duct located within and extending in the axial direction of said passage and being spaced inwardly from the surface of the passage forming therebetween an annular flow space extending in the axial direction of



said passage and cylindrical duct, said cylindrical duct having a first end close to the first end of said passage and a second end located at the second end of said passage adjacent the nip formed by said seal rolls, said annular flow space being closed at the end thereof located at the first end of said cylindrical duct, and a port for supplying pressurized air located in said seal block for supplying pressurized air into said annular flow space for flowing the pressurized air through the flow space to the second end of said cylindrical duct adjacent said seal rolls where the air contacts said sealing plates and the peripheral surface of said seal rolls and reverses direction and flows through said cylindrical duct toward the first end thereof, said sealing plates being flexible so that the pressurized air contacting said plates forces them into contact with the peripheral surface of said seal rolls.

4,064,714

LOCK BAR ASSEMBLY

Angelo Treslo, 1740 N. Linder Ave., Chicago, Ill. 60639

Filed Sept. 18, 1975, Ser. No. 614,366

Int. Cl.[2] E05B *71/00, 73/00*

U.S. Cl. 70—18 **7 Claims**

1. A lock bar assembly adapted for attachment to a variety of articles to effect the interlocking of said articles, comprising in combination,

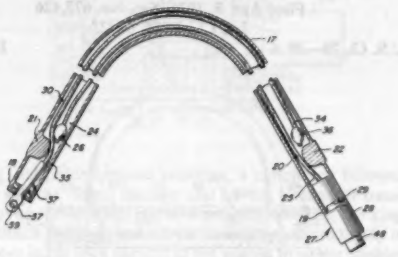
a hollow V-shaped tube having opposed ends and being hollow throughout the interior portion thereof, the arms of said V-shaped tube being substantially equal in length, said tube provided with a crimp portion adjacent each of said opposed ends,

each of said crimp portions extending a substantial length along the transverse interior diameter of said tube, wherein said crimps are each formed as flat portions thereby to function as mount points for mounting the said lock bar assembly to an article to be locked,

a pair of first and second cables provided within said hollow tube and each cable having an interior end and an exterior end,

each of said cables carrying stop means positioned at the interior ends thereof, said stop means coacting with a corresponding crimp to form a position whereby the interior end of each of said cables is securely held within the confines of said tube when fully extended,

lock means provided on the exterior end of said first cable and mating lock means provided on the exterior end of said second cable,



and each of said cables being reciprocally movable into and out of said tube until the interior ends thereof reach said stop positions,

whereby said hollow tube may be mounted on any of a variety of articles by mount means thereby to securely hold the same to the article and said first and second cables may be reciprocally moved out of the confines of said tube to encircle the article to be locked until said lock means of said first and second cables may be lockingly engaged thereby to interlock the same and securely hold between the confines of said hollow tube and said first and second cables the articles to be interlocked.

4,064,715

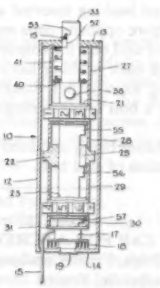
ANTI-THEFT DEVICE

David A. Hodgson, Hamburg, and James S. Grey, East Otto, both of N.Y., assignors to International Power Pole, Ltd., Hamburg, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,658

Int. Cl.[2] E05B *37/02, 73/00*

U.S. Cl. 70—18 **10 Claims**



1. An anti-theft device including a flexible cable adapted to be looped about an object to be secured or about a relatively fixed member to which the object is to be secured, or both; said device comprising a housing, a cable winding spool in said housing, said cable being wound thereon and having a free end projecting from said housing, a control member carried by said housing and including means for lockingly engaging an intermediate portion of said cable along the length thereof for

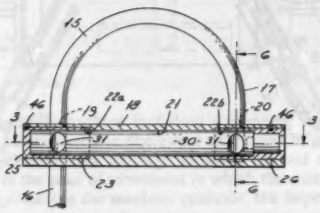
forming a closed loop at the outer portion of said cable, a combination lock in said housing, said control member being movable between locked and unlocked positions with respect to said cable under the control of said combination lock.

4,064,716

SAW RESISTANT LOCK

Warren M. Shwayder, Bloomfield Hills, and John T. Loftus, Detroit, both of Mich., assignors to The Shwayder Company, Birmingham, Mich.

Filed Apr. 5, 1976, Ser. No. 673,426
Int. Cl.[2] E05B 67/22
U.S. Cl. 70—38 A **10 Claims**



1. A lock comprising:
a bar-like base having a pair of spaced apart holes formed transversely thereof, and a bore extending longitudinally through said base;
a U-shaped shackle having its legs normally extending into said base holes for locking therein;
an elongated bolt member rotatably fitted within said bore and spanning the space between and overlapping said shackle legs within the bar;
each of said legs having a notch formed therein for partially receiving the adjacent overlapping portions of said bolt member and a notch formed in said bolt in alignment with each shackle leg, whereby axial rotation of said bolt member causes peripheral portions of said bolt member to enter into the shackle notches and thereby lock the shackle within the base, and continued rotation causes the bolt notches to axially align with the shackle legs for endwise movement of the legs relative to the base for unlocking the shackle;
and locking means operable for rotating said bolt;
the opposite ends of said base bore each being of an enlarged diameter relative to the central portion thereof;
a centrally bored bushing inserted and closely fitted within each of said bore opposite ends and receiving the adjacent end portion of said bolt for rotation of said bolt within the bushings, and each bushing having a notch aligned with and receiving its adjacent shackle leg portion, and also aligned with a bolt notch arranged within the respective bushing;
and said lock means being mounted within one of said bushings for rotation of said bolt.

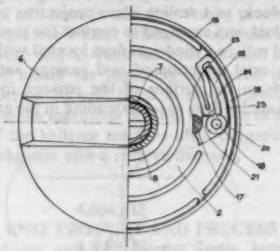
4,064,717

ANTI-THEFT CAP FOR A SCREWTHREADED BASE

Michel Neiman, Paris, France, assignor to Societe de Diffusion NEIMAN, Courbevoie, France

Filed May 24, 1976, Ser. No. 689,706
Claims priority, application France, July 24, 1975, 75.23079
Int. Cl.[2] B65D 55/14
U.S. Cl. 70—165 **2 Claims**

1. An anti-theft cap for a container having a screw threaded opening comprising a screw threaded closure member for cooperation with said screw threaded opening, stop means on said closure member, a cap member secured to and rotatable about said closure member, a lock fixedly connected to said cap member and including a catch element movable, upon operation of said lock, between a first and a second position, said catch element in said first position engaging said stop means and in said second position being disengaged from said stop means, rotation of said cap member with said catch in said first position imparting torque to said closure member and said cap member being freely rotatable on said closure member with said catch in said second position, said stop means comprising a pivoted lever elastically deflectable out of engagement with said catch element upon the application of a torque greater than a predetermined limit upon rotation of said cap member in one direction and abutment means on said closure member engaging said lever and preventing deflection of said lever upon rotation of said cap member in the opposite direction, and wherein said lever is a bell crank lever, one limb of which is substantially rigid and engages said catch element and the other limb of which is elastically deformable.

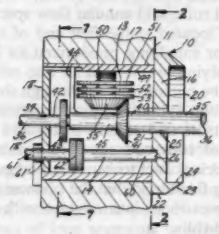


4,064,718

NUMERICAL COMBINATION REPLACEMENT PLUG FOR CYLINDER LOCKS

Lloyd G. Cowen, 816 Leeds Drive, North Bellmore, N.Y. 11710

Filed Feb. 28, 1977, Ser. No. 772,460
Int. Cl.[2] E05B 37/04
U.S. Cl. 70—302 **2 Claims**



1. As a new article of manufacture, a plug for a cylinder type lock comprising: a hollow housing element including a planar front wall, a cylindrical side wall and a generally planar rear wall, said walls defining a cavity having a principal cylinder axis; a dial element including a first axially positioned shaft supported by said housing element for selective rotational and axial movement relative thereto, said shaft extending through an opening in said front wall at a front end thereof; a dial knob supported upon said front end of said first shaft, and a first medially positioned spur gear on said first shaft; a tumbler element carried by said housing element, and driven by said first shaft, said tumbler element including a plurality of planar circular tumbler members, each having an opening therein selectively alignable with corresponding openings in the other tumbler members and having pin means interconnecting the same for limited rotational relative movement; a bar member carried by said first shaft for axial movement thereon and freely rotatable relative thereto, said bar member being selectively positionable within aligned openings in said tumbler members, said bar member normally preventing outward axial

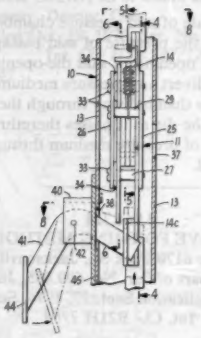
movement of said shaft; a second motion output shaft element carried by said housing element, and having a second spur gear thereon selectively engagable with said first spur gear; whereby upon the dialing of a correct combination resulting in the alignment of said openings in said combination tumblers, said first shaft may be moved axially outwardly of said housing element to position said bar member within said openings, and engage said first and second spur gears for the transmission of rotary motion from said knob to said second shaft.

4,064,719

EMERGENCY RELEASE FOR SECURITY PANELS

Maynard A. Boeckman, Kane, Pa., and Richard M. Singer, Lafayette, Calif., assignors to Kane Manufacturing Corporation, Kane, Pa.

Filed Aug. 18, 1976, Ser. No. 715,387
Int. Cl.[2] E05B *21/00*
U.S. Cl. 70—355 **3 Claims**



1. A security panel having a emergency release, said panel being mounted for opening or removal in one direction only and comprising: a frame having a key opening formed through one side and a slot opening formed through the opposite side, said openings being out of axial alignment; lock mechanism mounted in said frame, said lock mechanism comprising a pair of slide levers disposed on opposite sides of a set of tumblers, one slide lever being engageable by a key inserted through the key opening, the other slide lever being accessible from the opposite side of said frame through the slot opening; and means responsive to sliding actuation of said pair of slide levers for securing or releasing said frame to or from a support; and an emergency release subassembly comprising a support bracket and a bell crank pivoted from said bracket, one end of said crank being receivable through the slot opening and engageable with said other slide lever; whereby the security panel may be opened from a closed and locked position to an open position either by a key from one side of the panel or by applying a force to the bell crank from the opposite side of the panel.

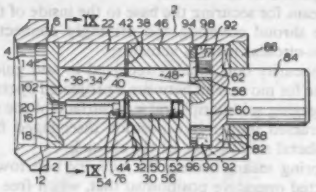
4,064,720

CYLINDER LOCK MECHANISMS

Eric Fry, Toronto, Canada, assignor to Jonathan Lock Limited, Downsview, Canada

Filed Feb. 28, 1977, Ser. No. 772,484
Claims priority, application United Kingdom, Mar. 26, 1976, 11092/76; Dec. 22, 1976, 53547/76
Int. Cl.[2] E05B *27/08*
U.S. Cl. 70—363 **10 Claims**

1. A cylinder lock mechanism comprising a body having a cylindrical bore, a lock plug extending longitudinally of the bore and normally freely rotatable therein, a plurality of pin tumblers housed in tumbler bores extending longitudinally within the plug and displaceable into predetermined longitudinal positions by insertion of a key into a keyway defined at the front end of the body and communicating with the tumbler bores, and a clutch member rotatable within the body to the rear of the plug, wherein a three part linkage extends between the tumblers and the clutch member comprising a transversely moveable actuator member normally disengaged from the tumblers and having a range of movement in a transverse guideway within the plug intermediate its ends so as to enter the tumbler bores in response to the tumblers simultaneously



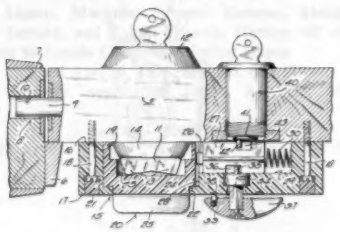
assuming said predetermined positions, a clutch dog between the plug and the clutch member and having a range of transverse movement into and out of a position coupling the plug and the clutch member, and a lever extending longitudinally in a lever bore in the plug parallel to but spaced from the tumbler bores, said lever being rockable about a fulcrum in said lever bore and engaging the actuator and the dog to coordinate their movements.

4,064,721

SECURITY LOCK FOR DEAD-BOLT DOOR LOCKS

Robert H. Morgan, Milwaukee, Wis., assignor to Richard V. Marsek, Wauwatosa, Wis., a part interest

Filed Oct. 7, 1976, Ser. No. 730,619
Int. Cl.[2] E05B *17/00*
U.S. Cl. 70—416 **12 Claims**



1. A locking device for preventing unauthorized retraction of the bolt of a dead-bolt door lock of the type wherein rotation of a key controlled actuator at the outside of the door and of a non-circular manual actuator at the inside of the door selectively effects projection or retraction of the dead bolt, depending in each instance upon the direction or rotation, said locking device comprising:

A. a base having
1. opposite inner and outer faces,
2. a round hole therethrough opening to both of said faces, and
3. a straight sided guideway that is substantially radial to the axis of said round hole and at one end thereof opens into said hole;

B. a shroud having an axis, rotatably seated in said round hole with its axis intersecting said inner and outer faces of the base and the axially opposite ends of the shroud accessible at said faces,
said shroud also having a keeper recess in a peripheral side surface thereof;

C. a socket in the end portion of the shroud that is accessible at the inner face of the base, said socket being of a size and shape to receive and fit said non-circular manual actuator of a dead-bolt lock with which the locking device is asso-

ciated, so that said non-circular manual actuator may be turned by rotating the shroud, the keeper recess in the peripheral side surface of the shroud being aligned with said guideway when the shroud is in its position of rotation at which the dead-bolt is in its projected position;

D. means at the end portion of the shroud that is accessible at the outer face of the base by which rotation can be imparted to the shroud;

E. means for securing the base to the inside of the door with the shroud covering and drivingly connected with said non-circular manual actuator;

F. a security bolt slidably received in said guideway in the base for movement between a projected operative position engaging said peripheral side surface of the shroud and a retracted inoperative position disengaged from said peripheral side surface of the shroud;

G. spring means biasing the security bolt towards its projected operative position so that, when free to be moved by said spring means, the security bolt snaps into the keeper recess in said peripheral side surface of the shroud upon rotation of the shroud to its position at which the dead bolt is in its operative position;

H. a control member for the security bolt selectively movable to a plurality of defined positions; and

I. drive means operatively connecting the control member with the security bolt and through which the operativeness of the security bolt is governed by selective positioning of the control member.

4,064,722

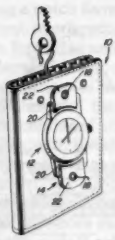
KEY CASE AND WATCH COMBINATION

Pearl M. Wolski, 13 Hartford St., South Hadley, Mass. 01075

Filed Aug. 31, 1976, Ser. No. 719,327

Int. Cl.[2] A44B *15/00*; A45C *11/32*; A47G *29/10*

U.S. Cl. 70—456 B **4 Claims**



1. In combination, a key case, a watch, and attachment means associated with both the key case and the watch for detachably connecting the watch to the key case, the attachment means including a pair of spaced first snap fastener parts affixed to the key case, and a pair of spaced second snap fastener parts provided on the watch for selectively cooperating with the first snap fastener parts, the key case being constructed from a flexible material and including a semi-rigid reinforcing strip arranged covering a back of the case for stiffening same, the first snap fastener parts being partially supported by the strip.

4,064,723

HYDROSTATIC EXTRUSION PRESS

Hans Gunnar Larsson, and Erik Westman, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

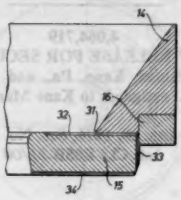
Filed June 29, 1976, Ser. No. 700,790

Claims priority, application Sweden, July 18, 1975, 7508221

Int. Cl.[2] B21D *22/10*

U.S. Cl. 72—60 **7 Claims**

1. A press for hydrostatic extrusion which comprises means forming a pressure chamber, a die mounted at one end of the pressure chamber having a passageway therein and including a conical inlet portion and a die-opening portion, said die-opening portion including an internal opening for forming a billet which is forced therethrough from inside the pressure chamber by a pressure medium to form a product of desired cross-section, said internal opening in said die-opening portion having the smallest cross-section in said passageway, said die including draining channel means which communicates between said passageway adjacent a lower part of said inlet portion of said



die and a space outside of said pressure chamber which is at a pressure lower than the pressure of said passageway so as to by-pass said internal opening of said die-opening portion and act to intercept and divert any pressure medium which accompanies the billet more than halfway through the passageway in the inlet portion of the die as it passes therethrough such that intermittent passage of pressure medium through said internal opening is prevented.

4,064,724

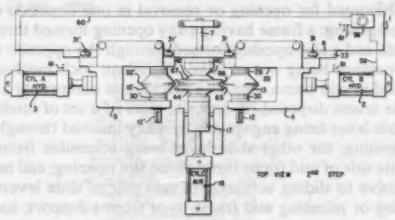
SHEAVE FORMING METHOD

James E. Armstrong, 6170 Park St., Jacksonville, Fla. 32205

Continuation-in-part of Ser. No. 600,585, July 31, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 726,764

Int. Cl.[2] B21H *1/04*

U.S. Cl. 72—108 **5 Claims**



1. The method of forming wiremill sheaves which comprises forming a blank by boring an axial cylindrical bearing opening through a steel plate workpiece roughly cylindrical in outline and said workpiece having a diameter of between about 2 and 50 times the thickness dimension of said plate, machining the cylindrical surface of the blank to the shape of a right cylinder coaxial with the axis of said opening, mounting said blank on arbor means fitting said opening, pressing circular face plates retained on such arbor means against the opposite faces of the blank with a force of at least several hundred pounds, said face plates being of equal diameters, forcing, with forces of the order of several tons toward and into the peripheral surface of said blank midway between the faces of the blank, the peripheral edges of two diametrically opposed driven forming rolls of hardened tool steel, said rolls being at least substantially identical and each being of right symmetrical double frusto-conical configuration with a peripheral edge centrally between the ends at which the conical faces meet at an included angle of between about 45° and 100°, such edge being radiused to a radius of about 0.03 to about 0.2 inches, while drivingly rotating said rollers at the same speeds to provide rotational movement of said peripheral edges of the order of hundreds of feet per minute and while maintaining the axes of rotation of said

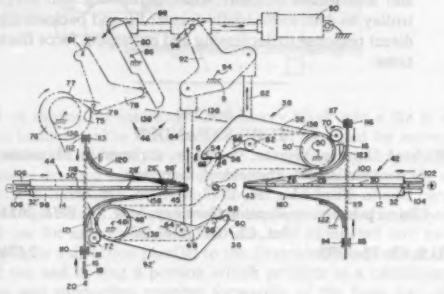
blank and rollers parallel and in the same plane, such forcing being balanced between said rollers and the force being applied perpendicularly of said axes, and the forcing causing initial grooving of the blank and progressive deepening of such groove and dividing of the peripheral portion of the blank into two outturned lips, continuously applying a lubricant resistant to high temperatures and high pressure to the contacting surfaces of the blank and rollers while said groove is being so formed, and maintaining sufficient force of the forming rolls against the blank to cause such lips to hug and to be polished by said faces of the forming rolls, whereby said lips are caused to define therebetween a polished wire-receiving sheave groove having a bottom rounded to said radius and having hardened wear resistant surfaces.

4,064,725

APPARATUS FOR MAKING SPIRALLY WOUND ELECTROCHEMICAL CELLS

Leonard F. Hug, Wheatridge; Donald H. McClelland, Littleton, and Toshio Uba, Denver, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Oct. 18, 1976, Ser. No. 733,674
Int. Cl.² B21C *47/12*
U.S. Cl. 72—147 **7 Claims**



1. Apparatus for spirally winding electrode plates and interleaved separators into a generally cylindrical form, comprising:

first and second retractable juxtaposed winding heads having driving surfaces;

means for advancing and retracting the winding heads relative to each other;

a free turning mandrel positioned between the driving surfaces;

means for feeding a leading edge of one of the electrode plates flanked on at least one of its sides with separator material in between the mandrel and the driving surface of the winding head;

means for feeding a leading edge of the other electrode plate flanked on at least one of its sides with separator material in between the mandrel and the driving surface of the second winding head; and

means for driving at least one of the driving surfaces about the winding head to spirally wind the electrode plates and separators.

4,064,726

METHOD OF MANUFACTURING PRESSURE POTS HAVING A BAYONET CATCH, AND APPARATUS FOR CARRYING OUT SUCH METHOD

Dietrich Hinze, Breslauer Str. 9, 4730 Ahlen, Germany

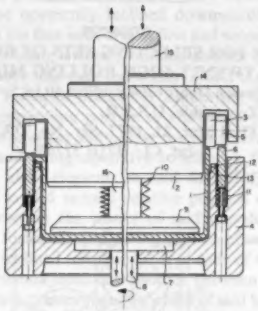
Filed Oct. 29, 1975, Ser. No. 626,785
Claims priority, application Germany, Nov. 11, 1974, 2453374
Int. Cl.² B21D *51/24*
U.S. Cl. 72—70 **8 Claims**

1. A method of manufacturing pressure cooking pots having a cylindrical wall and an upper radially outwardly projecting rim having underlying cam surfaces for cooperation with a lid structure for the pot, said method comprising the steps of:

rotating said rim of said pot relative to spinning rollers, engaging an upper portion of said rim with said rollers and applying pressure for folding over said rim,

engaging the undersurface of said folded over rim with a profile complementary to at least a portion of said underlying cam surfaces and forming said cam surfaces during the folding over of said rim, engaging the radially outer side of the folded over rim to limit outward movement of metal during the folding over and cam forming steps,

and removing portions of said rim above said cam surfaces until gaps between adjacent portions of said cam surfaces are exposed to complete the formation of said rim.

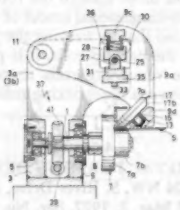


4,064,727

ROLL FORMING MACHINE

Tadashi Amano, Machida; Susumu Kawano, Atsugi; Kenji Mano, Isehara, and Takaji Irisawa, Hatano, all of Japan, assignors to Amada Company, Limited, Japan

Filed Apr. 26, 1976, Ser. No. 680,379
Claims priority, application Japan, Apr. 25, 1975, 50-55800[U]
Int. Cl.² B21D *5/14*
U.S. Cl. 72—179 **7 Claims**



1. A roll forming machine for forming sheet metal of a given range of thickness comprising a plurality of forming units disposed sequentially along a work path and adapted to form said sheet metal into a given shape in a series of progressive deformations, each of said forming units including a frame rotatably supporting a lower roller about a first axis of rotation, said lower roller including working surfaces provided by a bending portion and a holding portion defining a predetermined angle therebetween, an upper roller having two frusto-conical peripheries divided by a transverse median plane and disposed in confronting relation to the working surfaces of said bending and holding portions of said lower roller and spaced therefrom by a distance corresponding substantially to a given thickness of said sheet metal, said frusto-conical peripheries defining an angle therebetween corresponding substantially to

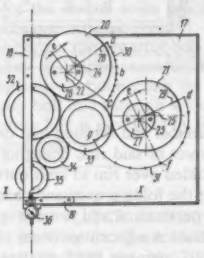
said predetermined angle, swingable means for mounting said upper roller in said frame such that when said upper roller is in confronting relation to said lower roller its axis of rotation is inclined to said first axis, and means for moving said swingable means to swing said upper roller along an arcuate path having a tangent which substantially bisects said predetermined angle in order to vary the distance between said upper and lower rollers and thereby accommodate sheet metal of different thicknesses within said range.

4,064,728

DEVICE FOR SELECTING SETS OF ROLLS FOR TWENTY-HIGH ROLLING MILL

Leonid Vasilievich Dobrovolsky, ulitsa 40 let Sovetskoi Ukrainy 7, kv. 25, Zaporozhie, U.S.S.R.

Filed Mar. 21, 1977, Ser. No. 779,523
Int. Cl.[2] B21B *31/08*
U.S. Cl. 72—238 **2 Claims**



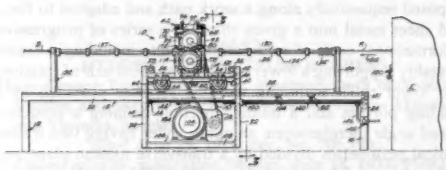
1. A device for selecting sets of rolls for a twenty-high rolling mill, said device being a model of said mill, comprising: a flat board; eccentric disks installed on said board in full conformity with the positioning of backup rolls of a rolling mill and being rotatable in the plane of said board, the dimensions of said disks corresponding to the dimensions of the backup rolls of the rolling mill; a vertical guide member secured on said board and adapted for disks corresponding working and idle rolls to traverse therealong; a horizontal bar corresponding to the pass line of the rolling mill, with respect to which the position of the working roll is determined; other disks installed on said board in conformity with the positioning of intermediate and drive rolls in the rolling mill, said model thus forming a two-dimensional model of the roll arrangement in the rolling mill, so that by varying the position of said disks corresponding to the backup rolls, it is possible to select the dimensions of the remaining rolls to provide the required processing gap between the working rolls of the rolling mill.

4,064,729

METAL FORMING DEVICE

Alex Homery, 3324 NW. S. River Drive, Miami, Fla. 33142

Filed Mar. 2, 1977, Ser. No. 773,517
Int. Cl.[2] B21C *25/00*; B21B *15/00*; B21C *35/02*; B65H *37/00*
U.S. Cl. 72—256 **15 Claims**



1. A device for imparting a continuous decorative design to a metallic extrusion as it emerges outwardly from an extruder in a relatively soft condition in a continuous rod form along a generally straight path of travel, and under the influence of a predetemined range of fluctuating outwardly directed pressure forces, said device comprising,

an elongated fixed frame including track means in a generally parallel relation to the straight path and including a forward end adjacent the extruder and a rear end,

a carriage trolley including wheel means for engagement on said track means for movement toward and away from the extruder,

upper and lower forming rollers, having one-to-one ratio, rotatably mounted on said carriage trolley in a peripheral rolling engagement with each other, at least one of said rollers being peripherally grooved with desired design characteristics formed in said groove, said forming rollers being positioned for passage of the continuous rod therebetween through said groove as it emerges from the extruder to impart the cross sectional shape of said groove and said design characteristics along the length of said extrusion,

means to exert a predetermined amount of outwardly directed pressure forces against said carriage trolley,

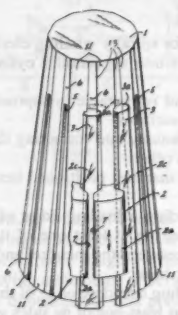
means to drive said forming rollers in predetermined opposite directions at alike predetermined numbers of revolutions per minute to substantially counter the combined outwardly directed forces of the continuous rod extrusion and said means to exert while permitting said carriage trolley to drift sequentially forwardly and backwardly in direct response to decreasing and increasing force fluctuations.

4,064,730

TUBE EXPANDER

Richard Gerretz, Viersen, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Mar. 16, 1977, Ser. No. 778,227
Claims priority, application Germany, Mar. 18, 1976, 2611702
Int. Cl.[2] B21D *41/02*
U.S. Cl. 72—393 **2 Claims**



1. A mechanical expander for tubes comprising:

a trunkated polyhedral pyramid having a wide end and a narrow end, further having first glide surfaces being inclined with respect to the axis and having at least in parts rectangular configuration, second surfaces alternating with said first surfaces and being also inclined and having trapezoidal configuration, there being T-shaped longitudinal grooves in said second surfaces, ending ahead of the narrow end of said pyramid;

guide elements of double-T configuration having a stem portion, a first and a second crossbar portion, the first crossbar portions of said guide elements being respectively slid into said grooves, the second crossbar portion having lateral rail portions, whereby the rail portions of adjacent guide elements facing each other across one of the first surfaces extend parallel to each other;

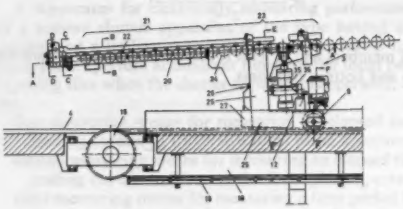
means for securing the guide elements in a slid position of their respective first crossbar portions in the grooves; and tube expanding segments slidably seated on said first surfaces and each having two lateral ridges respectively engaged with the rail portions of the guide elements disposed alongside the respective first surface and being guided therein.

4,064,731

DEVICE FOR INSERTING A HOT, HEAVY BLANK IN A DIE

Karl Ivar Brandstrom, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Nov. 26, 1975, Ser. No. 635,570
Claims priority, application Sweden, Dec. 11, 1974, 7415512
Int. Cl.[2] B21D *43/16*; B65G *13/00*
U.S. Cl. 72—419 **14 Claims**



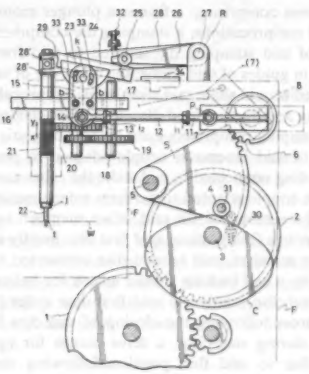
1. A device for inserting a hot, heavy blank into a die in a drop hammer or the like, comprising a car mounted for movement toward and away from the die, an upstanding supporting member on said car extending upwardly from said car in a direction transverse to the direction of movement of said car, an elongated unit mounted on said supporting member above said car for movement with said car, said elongated unit extending in a direction parallel to the direction of movement of said car and having a portion which projects as a cantilever from said supporting member forwardly of the front end of said car whereby movement of said car toward the die is adapted to move the forwardly projecting portion of said elongated unit into at least partially overlying relation to the die, said elongated unit including a pair of elongated shafts mounted for rotation about their respective axes of elongation, said shafts being disposed in spaced relation to one another and extending in the direction of movement of said car, a first plurality of elongated coplanar slide elements attached at one end to one of said rotatable shafts and extending in spaced relation to one another in directions transverse to the direction of elongation of said one shaft partially across the space between said shafts toward the other of said shafts, a second plurality of elongated coplanar slide elements attached at one end to said other rotatable shaft and extending in spaced relation to one another in directions transverse to the direction of elongation of said other shaft partially across the space between said shafts toward said one shaft, the free end of each of said first plurality of slide elements being disposed adjacent to and spaced from the free end of one of said second plurality of slide elements in the space between said shafts, said blank being adapted to be supported on said slide elements adjacent their respective free ends, spacer means extending between the forward ends of said shafts relative to said die for preventing said forward ends of said shafts from spreading apart from one another due to the weight of said blank, and positioning means on said car coupled to said elongated unit for rotating each of said elongated shafts through selected angles to vary the orientation of said coplanar pluralities of slide elements, transmission means interconnecting said shafts adjacent said forward ends of said shafts for causing the rotation of one shaft through a given angle in a given direction to effect synchronized rotation of the other shaft through said given angle in the opposite direction, said positioning means cooperating with said transmission means to selectively effect a first relative position of the slide elements in the forwardly projecting portion of said elongated unit wherein said first and second pluralities of slide elements in said forwardly projecting portion are disposed in substantially coplanar relation to one another, being operative to selectively effect a second relative position of the slide elements in said forwardly projecting portion of said elongated unit wherein said first plurality of coplanar slide elements are disposed in a plane inclined downwardly from said one shaft and said second plurality of coplanar slide elements are disposed in a plane oppositely inclined downwardly from said other shaft with the free ends of said first and second pluralities of slide elements being spaced from one another between said shafts by a distance less than the width of said blank to define a substantially V-shaped cradle for supporting the blank on said forwardly projecting portion at a position overlying the die forwardly of said car and below the plane defined by said pair of shafts, and being operative to effect a third relative position of the slide elements in said forwardly projecting portion similar to said second relative position of said slide elements but wherein the planes of said pluralities of slide elements in said forwardly projecting portion of said elongated unit are further inclined to space the free ends of said first and second slide elements from one another between said pair of shafts by a distance greater than the width of said blank to drop the blank from said V-shaped cradle into the die.

4,064,732

COIL ACTUATING APPARATUS IN A COIL SPRING MAKING MACHINE

Takeji Matsuoka, No. 2-703, 26, 3-chome, Ohjima, Kohto, Tokyo, Japan

Filed Sept. 8, 1976, Ser. No. 721,231
Int. Cl.[2] B21F *3/04*
U.S. Cl. 72—449 **2 Claims**



1. A coil actuating apparatus in a coil spring making machine, comprising a frame, a main cam secured to a cam shaft mounted on said frame, means to drive said cam mounted on said frame, a quadrant gear pivotally mounted on said frame carrying a cam follower in contact with an outer peripheral edge of said main cam, a return spring of which one end is secured to a lower portion of said quadrant gear, a driven gear meshing with an upper portion of said quadrant gear, a fastening member, a disc integral with said fastening member fixed to said driven gear, a first support shaft extending through and fixed in the center of said disc, a crank arm secured to one end of said support shaft, a connecting member pivotally connected at one end to said crank arm through a crank pin, a connecting rod connected at one end to the other end of connecting member, a further connecting member secured to the other end of said connecting rod, a connection pivotally secured to said second connecting member, a rack secured to a

lower portion of said connection, a pinion supporting a gear meshed with said rack, and a spindle gear carrying a winding shaft meshed with said gear, a setting position of said crank arm in relation to said driven gear being adjustable.

4,064,733

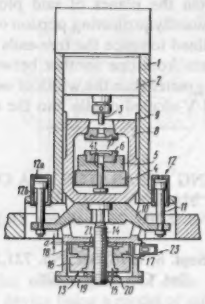
PRESS

Anatoly Sergeevich Grigorenko, ulitsa Tovstukho, 9, kv. 21; Vasily Savelievich Kravchenko, ulitsa Industrialnaya, 22, kv. 1; Jury Antonovich Moroz, ulitsa Fugenfirova, 11, kv. 91; Leonid Ivanovich Kortusov, prospekt Mira, 57-a, kv. 10, and Vladimir Ivanovich Vimba, ulitsa 50 let komsomola, 4-v, kv. 55, all of Omsk, U.S.S.R.

Filed Oct. 5, 1976, Ser. No. 729,874

Int. Cl.[2] B21J *9/12*

U.S. Cl. 72—453.03 **2 Claims**



1. A press comprising: a frame; a plunger mounted on said frame for reciprocations; a stamping die comprising two dies; one die of said stamping die secured to said frame; an slide mounted in guides of said frame; the other die of said stamping die secured to said slide; said slide being reciprocably mounted for closing and opening said dies; means for clamping said dies during stamping comprising a nut-screw kinematic couple; one member of said kinematic couple adapted to perform linear motion, being connected to said slide; the other member of said kinematic couple adapted to perform rotary motiion; first and second discs mounted on said other member and adjoining each other in a first postion; said first disc fixedly connected to said other member; said second disc connected to said other member by a self-locking thread means for helical motion of said second disc relative to said first disc under the action of inertia forces following the closing of said dies for clamping the dies during stamping; a drive means for returning said second disc to said first position following stamping; and means for displacing said plunger and said slide.

4,064,734

HAMMER FORGING PRESSES

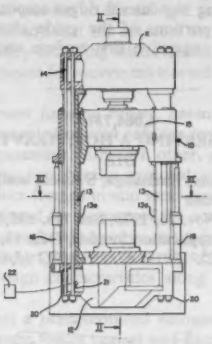
Hans J. Pahnke, Dusseldorf, Germany, assignor to Pahnke Engineering G.m.b.H. & Co. KG, Dusseldorf, Germany

Filed May 4, 1976, Ser. No. 683,078

Int. Cl.[2] B21J *13/04*

U.S. Cl. 72—455 **5 Claims**

1. A frame for a hammer forging press having a horizontal forging axis, said frame consisting of two vertical U-shaped frame members, one on each side of the forging axis of said press, a bed extending obliquely between said frame member generally at a right angle to the forging axis, said vertical members being positioned at an oblique angle to said forging axis, a top transom above the forging axis on top of and connecting said vertical members, a bottom transom including said bed beneath the forging axis and beneath and connecting said



vertical members and at least four vertical tie rods connecting the top and bottom transoms.

4,064,735

EXCITATION AND SPECTRAL CALIBRATION OF ACOUSTIC EMISSION SYSTEMS

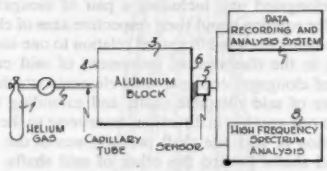
Thomas Sherret Hutchison, Kingston, and Stuart Livingstone McBride, Invarerary, both of Canada, assignors to Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed July 21, 1976, Ser. No. 707,181

Claims priority, application United Kingdom, Sept. 16, 1975, 037909/75

Int. Cl.[2] G01C *25/00*

U.S. Cl. 73—1 R **15 Claims**



1. A method for spectral calibration of acoustic emission systems, comprising

a. acoustically coupling a first transducer, having a flat frequency response up to about 1 MHz, to a reference material;

b. exciting said reference material with a broad spectrum noise means, thereby generating an output signal from said first transducer;

c. measuring said output signal from said first transducer;

d. acoustically coupling a second transducer to a test piece and exciting said test piece with said broad spectrum noise means, thereby generating an output signal from said second transducer;

e. calibrating said output signal of said second transducer relative to said output signal of said first transducer;

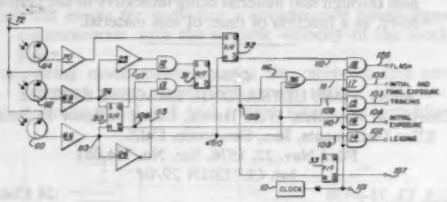
f. measuring an acoustic emission spectrum from said test piece; and

g. correcting said acoustic emission spectrum relative to said calibrated output signal of said second transducer.

4,064,736
METHOD AND APPARATUS FOR MEASURING PERFORMANCE TIMES OF A SHUTTER APPARATUS

Tracy Ireland, 1203 S. Tyler, Loveland, Colo. 80537

Filed Oct. 1, 1976, Ser. No. 728,763
Int. Cl.[2] G04F 7/10
U.S. Cl. 73—5 25 Claims



1. Apparatus for electrically measuring performance times of a camera shutter apparatus of the type having a leading curtain and a trailing curtain which are caused to traverse a focal plane aperture at different times for the usual purpose of exposing film when the shutter apparatus is operated, comprising:

first measuring means for measuring an elapsed time for a leading curtain to traverse a focal plane aperture;

second measuring means for measuring an elapsed time for a trailing curtain to traverse the focal plane aperture;

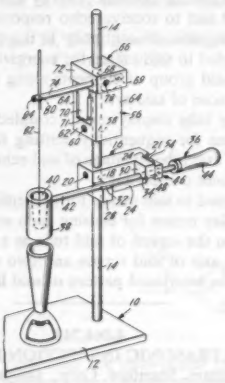
third measuring means for measuring a time period between the time that the leading curtain starts the traverse of the focal plane aperture and the time that the trailing curtain starts the traverse of the focal plane aperture; and

display means operative in conjunction with the first, second and third measuring means for displaying at least one of the times measured.

4,064,737
LABORATORY STAND ASSEMBLY

Walter Joseph Sieverin, Buffalo Grove, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Oct. 21, 1976, Ser. No. 734,666
Int. Cl.[2] G01N 25/04
U.S. Cl. 73—17 R 11 Claims

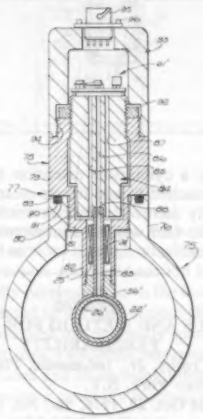


1. A laboratory stand assembly, comprising: a stand having a post, and being adapted to support said post in a generally upright position; a sample holder bracket mounted on said post of said stand and having a pair of horizontally and vertically spaced lugs extending outwardly from one side thereof; and a sample holder having a sample-receiving portion and an elongated handle portion extending from said receiving portion, said holder being disengageably supported on said holder bracket, adjacent said one side thereof, with said handle portion thereof engaged between said lugs of said bracket and constrained thereby against pivotal movement, to prevent downward movement of said receiving portion, said sample holder and said holder bracket each having means thereon which cooperate to constrain said receiving portion to a maximum spacing from said post, and each having means thereon which cooperate to prevent rotational movement of said holder about the axis of said handle portion thereof.

4,064,738
VIBRATION DENSITOMETER

Milton H. November, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,265
Int. Cl.[2] G01N 9/00
U.S. Cl. 73—32 A 2 Claims



1. A vibration densitometer comprising: an electromechanical oscillator including a probe and a feedback circuit connected in a loop; a function generator connected from said feedback circuit; and utilization means connected from said function generator, said probe including inner and outer concentric cylinders fixed relative to each other, said outer cylinder having a hole extending radially therethrough, a shaft slidable through said hole in engagement with said inner cylinder, and means to vibrate said shaft in the direction of its axis to cause vibration of said inner cylinder, said outer cylinder being completely hollow except for said inner cylinder positioned therein, said inner cylinder being hollow completely therethrough.

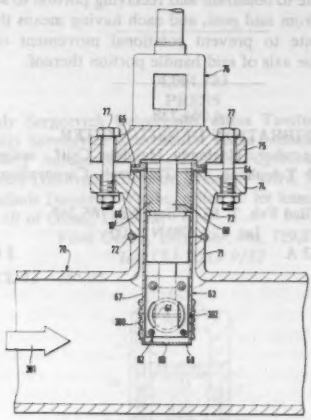
4,064,739
DENSITOMETER

Milton H. November, Hacienda Height, and LaVerne D. Lyon, Claremont, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 709,582, July 29, 1976, Pat. No. 4,037,460.
This application Feb. 7, 1977, Ser. No. 766,224
Int. Cl.[2] G01N 9/00
U.S. Cl. 73—32 A 8 Claims

1. A vibration densitometer comprising: an electromechanical oscillator including a probe having input and output leads, and a loop circuit having an input lead connected from said probe output lead and an output lead connected from said probe input lead; a lower mounting body having a cylindrical passageway therethrough; a hollow cylindrical well; means mounting said well concentrically within said passageway, said probe being fixed inside said well, said probe having a vane

supported near the bottom of said well; driver means to vibrate said vane, said driver means being located above said vane, said driver means including a cylindrical housing disposed concentrically within said well contiguous to said well; an



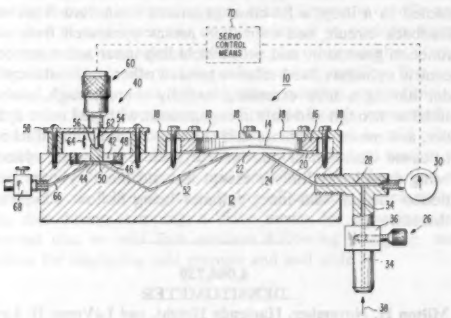
upper mounting; a cylindrical extension fixed to said upper mounting and attached to said driver means cylindrical housing concentrically therewith and concentric with said well in spaced relation to said well; and an annular body positioned around said extension.

4,064,740

APPARATUS AND METHOD FOR MEASURING PERMEABILITY

Edward Lewis Crosby, Jr., Indialantic, Fla., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 22, 1976, Ser. No. 734,728
Int. Cl.[2] G01M *3/26*
U.S. Cl. 73—38 **9 Claims**



1. An apparatus for measuring the permeability of a material to a gas comprising:

support means impermeable to said gas;

clamp means for clamping said material to said support means and forming a test chamber between said material and said support means;

means in fluid communication with said test chamber for filling said chamber with said gas at a given test pressure value which tends to decrease, with time, to a lower test pressure value as said gas passes through said material;

diaphragm means in fluid communication with said test chamber secured to said support means and forming a chamber therebetween for supplying sufficient gas to said test chamber for returning the pressure therein to said given value and including means connected to said support means for displacing said diaphragm means to thereby alter the volume of said last-mentioned chamber; and

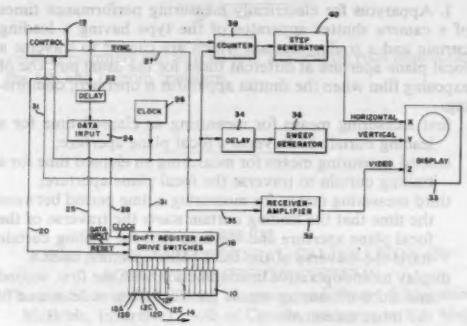
means for indicating the volume of gas required to return said pressure within said chamber to said given value, said volume and the time during which the gas is permitted to pass through said material being indicative of the permeability, as a function of time, of said material.

4,064,741

REAL-TIME ULTRASONIC IMAGING SYSTEM

Charles A. Reynolds, West Haven, Conn., assignor to Smith-Kline Instruments, Inc., Sunnyvale, Calif.

Filed Nov. 22, 1976, Ser. No. 744,081
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—620 **24 Claims**



24. A real-time ultrasonic cross-sectional imaging system including in combination:

a segmented transducer array formed of juxtaposed elements;

means coupled to said array for energizing a selected group comprising a predetermined quantity of juxtaposed elements for causing each element in said group to simultaneously transmit acoustic energy into an object to be examined and to receive echo responsive signals arising from an acoustic discontinuity in the object;

means coupled to said means for energizing for sequentially shifting said group of elements along said array for providing a scan of said array;

cathode ray tube display means coupled to said array and said means for sequentially shifting for displaying on a screen of said tube an image of said echo responsive signal;

the improvement comprising:

means coupled to said means for sequentially shifting and to said display means for causing each scan of said array to appear on the screen of said tube as a set of spaced lines along an axis of said screen and two successive scans to provide an interlaced pattern of said lines.

4,064,742

ULTRASONIC INSPECTION DEVICE

Richard J. Pittaro, Stamford, Conn., assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Jan. 31, 1977, Ser. No. 764,343
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—611 **8 Claims**

5. A pulse-echo ultrasonic apparatus comprising:

a clock for producing periodic trigger signals;

pulser means coupled for receiving said trigger signals and producing respective transmit pulses;

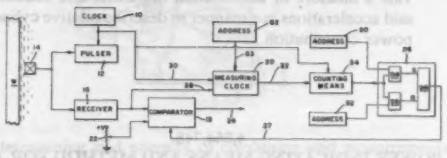
ultrasonic probe means adapted to be acoustically coupled to a workpiece and connected for receiving said transmit

pulses for causing respective ultrasonic search signals to be transmitted into the workpiece and to receive echo signals arising from said search signal intercepting the entrant surface and defects in the workpiece and providing electrical echo responsive signals responsive thereto;

receiver means coupled to said probe means for receiving said electrical echo responsive signals and providing respective echo responsive electrical signals;

address means for providing a programmed count signal commensurate with the acoustic velocity of the workpiece;

measuring clock means coupled for receiving said programmed count signal, said entrant surface responsive electrical signal and said trigger signals for providing



clock pulses synchronized with said entrant surface responsive electrical signal and having a frequency commensurate with said programmed count signal;

counting means coupled for receiving said clock pulses for providing a count signal commensurate with the quantity of clock pulses received by said counting means;

further address means for providing signals defining a predetermined region of the workpiece to be examined, and

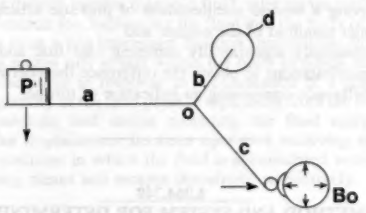
gate generating means coupled to said counting means and said further address means for receiving said count signal and said signals defining a region of the workpiece and providing a defect gate during the interval that echo responsive electrical signals arising from defects disposed in said predetermined region of the workpiece are to be received.

4,064,743

UNIVERSAL EYE PRESSURE IMPULSE TONOMETER AND METHOD OF MEASURING THE INTRA-OCULAR PRESSURE

Antonio Foddis, Viale A. Diaz (Grattacielo p.1), 29, Cagliari, Italy

Filed June 24, 1976, Ser. No. 699,276
Int. Cl.² A61B 9/00
U.S. Cl. 73—80 **8 Claims**



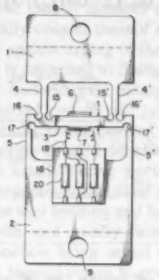
6. A method of measuring the intra-ocular pressure, comprising the steps of placing a three-armed structure with a first arm in a horizontal position and a second and third arm extending respectively upwardly and downwardly from one end of said first arm, said second and third arms being rigidly connected to said first arm, bringing a measuring body on the free end of said third arm into engagement with the eyeball, applying a weight to said first arm to exert a pressure on the eyeball through said three-armed structure and said measuring body, said pressure producing an increase of the intra-ocular pressure, suddenly removing the weight from said first arm whereby said increased intra-ocular pressure will cause oscillation of said three-armed structure about an axis of oscillation formed by the point of connection between said three arms, and measuring the amplitude and duration of said oscillations.

4,064,744

STRAIN SENSOREXTENSIOMETER

Walter P. Kistler, Redmond, Wash., assignor to Kistler-Morse Corporation, Bellevue, Wash.

Filed June 4, 1976, Ser. No. 692,977
Int. Cl.² G01B 7/16; G01L 1/22
U.S. Cl. 73—88.5 R **11 Claims**



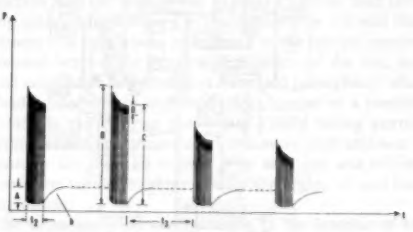
1. A strain measuring instrument with electrical output, comprising two end sections through which the instrument can be attached to a structure and a mid-section including a beam arranged substantially perpendicular to the instrument axis and mechanically connected to the end sections through two pairs of symmetrically arranged but unequally spaced flexible bridges and carrying at least two strain responsive resistive elements, said end sections and beam being integrally formed by a solid metal bar having a generally rectangular cross section.

4,064,745

METHOD OF PROVIDING REPRESENTATION OF AGING OF MATERIAL

Friedbert Gaddum, Schulstrasse 6, 3031 Ahlden, Aller, Germany

Filed May 20, 1976, Ser. No. 688,420
Claims priority, application Germany, May 21, 1975, 2522362
Int. Cl.² G01N 3/32
U.S. Cl. 73—91 **6 Claims**



1. Method of determining and measuring aging and/or age-dependent properties of a specimen comprising the following steps:

first, subjecting the specimen to alternating mechanical load-no-load conditions for a period during which the maximum reaction force effective during sequential load phases still declines;

second interrupting the first mentioned step for a period longer than a period needed for about 70% to 80% recovery of the specimen, the recovery being or would be

completed when, following a load change, the reaction force has again reached a constant level;

repeating the first and second steps in cyclic fashion; and

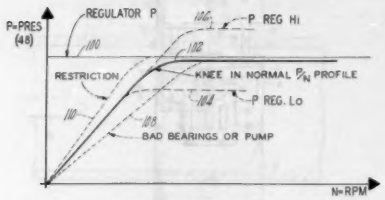
measuring the reaction force on the specimen.

4,064,746

PARAMETER CONTROLLED SPEED DETERMINATION IN INTERNAL COMBUSTION ENGINE DIAGNOSTICS

Henry J. Mercik, Jr., and Lee R. Armstrong, both of Enfield, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1976, Ser. No. 684,039
Int. Cl.[2] G01L *3/00*
U.S. Cl. 73—116 **9 Claims**



1. In the method of testing the oil system of an internal combustion engine, the steps of:

accelerating an engine while loaded only with its own inertia, drag and accessory loads;

measuring a rate of change of pressure as the engine accelerates;

determining a decreasing slope in said rate; and

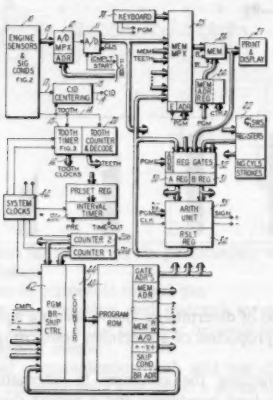
determining the oil pressure and the engine speed at the determined point of decreasing slope.

4,064,747

RELATIVE AND SUB-CYCLIC SPEED MEASUREMENTS FOR INTERNAL COMBUSTION ENGINE DIAGNOSTICS

Richard J. Rackliffe, Agawam, Mass.; Harvey J. Goodfriend, Simsbury, and Lee R. Armstrong, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1976, Ser. No. 684,033
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—116 **7 Claims**



7. In a method of determining relative sub-cyclic dynamic operating conditions of a reciprocating internal combustion engine, the steps of:

measuring the time required for the engine to rotate through substantially equal, successive small angles, said angles being a fraction of the angle of revolution of the engine allocated to the power stroke for each cylinder thereof;

measuring a full cycle of engine revolutions, said full cycle of engine revolutions comprising one revolution in a two stroke engine and two revolutions in a four stroke engine;

measuring angles which comprise a substantial portion of a power stroke of each cylinder and angles which comprise cylinder to cylinder angular increments from the beginning of said power stroke angles;

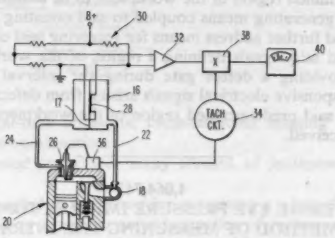
and determining the speed at the start of each power stroke angle and at the end of each of said power stroke angles for each of said cylinders, taking the difference between the start and end speed for each of said cylinders to provide a measure of acceleration therefore, and indicating said accelerations in a manner to describe relative cylinder power contribution.

4,064,748

POWER INDICATING MEANS AND METHOD FOR AN INTERNAL COMBUSTION ENGINE

Ervin Leshner, and Michael D. Leshner, both of Cherry Hill, N.J., assignors to Fuel Injection Development Corporation, Bellmawr, N.J.

Filed Aug. 19, 1976, Ser. No. 715,836
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—117.3 **15 Claims**



13. The method of producing an indication of the torque being developed by an internal combustion engine, comprising the steps of:

deriving a first manifestation of pressure arising within a cylinder of the engine;

deriving a second manifestation of pressure arising in the inlet manifold of the engine; and

continuously algebraically summing said first and second manifestations to obtain the difference therebetween said difference comprising an indication of torque.

4,064,749

METHOD AND SYSTEM FOR DETERMINING FORMATION POROSITY

Robert W. Pittman, Sugarland, and Chester E. Hermes, Houston, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,998
Int. Cl.[2] E21B *49/00*
U.S. Cl. 73—152 **8 Claims**

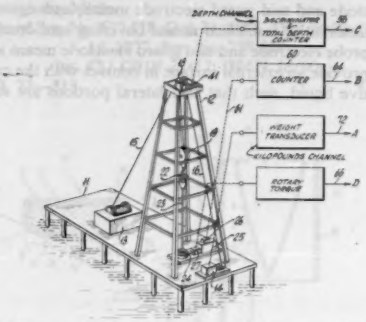
1. Method for determining porosity of a formation from drilling response, wherein a bit is attached to the lower end of a drill string that is rotated while the downward force on said bit is controlled, comprising the steps of

measuring the revolutions of said bit,

measuring the depth of said bit in the borehole,

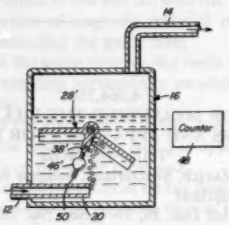
measuring the weight on said bit,

determining the tooth dullness of said bit,
measuring the torque applied to said drill string,
determining a reference torque empirically, and



determining said porosity of combining said measurements and determinations.

4,064,750
GAS FLOW TOTALIZER
Richard E. Speece, 2123 Reynolds St., Falls Church, Va. 22043
Filed June 1, 1976, Ser. No. 691,763
Int. Cl.[2] G01F *3/00*
U.S. Cl. 73—194 R **14 Claims**



1. In a meter for measuring the flow of a fluid through a conduit, a container connected to said conduit and through which said fluid flows, a static body of fluent medium of substantially constant quantity enclosed within said container and having a density greater than said fluid, inlet means connected to said conduit for discharging the fluid into the body of fluent medium from a predetermined location therewithin, fluid entrapping means submerged within the body of fluent medium for displacement in response to accumulation of a predetermined quantity of the fluid prior to separation from the body of fluent medium, and means mounting the fluid entrapping means for displacement between operative receiving and releasing positions in which the fluid is accumulated within the entrapping means and escapes therefrom, respectively.

4,064,751
FLOWMETER
Norbert F. Deisenroth, Des Plaines; John P. Nordhaus, Northbrook, and Abe Siegelman, Morton Grove, all of Ill., assignors to Elematic Instrument Corporation, Morton Grove, Ill.
Filed Oct. 18, 1976, Ser. No. 733,182
Int. Cl.[2] G01F *1/40*
U.S. Cl. 73—207 **12 Claims**

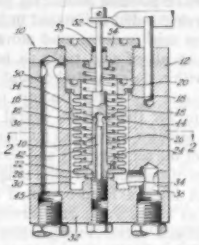
1. A flowmeter comprising

A. a housing having means defining a fluid flow path through the housing and including inlet and outlet ports communicating with the path and adapted respectively to be connected to a fluid source and fluid output means, the flowmeter adapted to measure pressure differential between said inlet and outlet ports,

B. said fluid flow path including a hollow, elongate tubular member and means mounting and guiding the tubular member for rectilinear axial movement within said housing, the interior of said tubular member comprising an elongate passageway having a fluid connection with said outlet port adjacent one end of said tubular member and the mounting and guiding means including biasing means urging the tubular member to move axially in the direction of the second end of said tubular member,

C. said mounting and guiding means having a fluid pressure responsive axially facing portion located adjacent the second end of the tubular member and connected therewith and generally coaxial thereof adapted to move the tubular member against urging of the biasing means when the said portion is subjected to fluid pressure greater than the said urging, said elongate passageway having an entrance at the second end of said tubular member in the center of said axially facing portion,

D. said housing having a fluid inlet chamber formed at least adjacent to the axially facing portion with the axially facing portion exposed to said fluid inlet chamber, a projection formed in said housing and having an annular seat in alignment with said axially facing portion and said axially facing portion being urged towards said seat in response to said biasing means to constrict said entrance, said fluid inlet chamber being otherwise fluid-isolated from the outlet port and said fluid connection,



E. a rigid rod mounted to said housing in the center of said seat coaxial with the elongated passageway and extending substantially fully into said passageway when said portion is in its most constricting position, but being of lesser cross section than the passageway to form a narrow fluid flowing space around the rod in the passageway, the said fluid connection comprising an opening in the tubular member located beyond the furthest penetration of the rod, said rod adapted to be withdrawn from said passageway when fluid is admitted to said fluid inlet chamber at a pressure which is sufficient to move said axially facing portion from its most constricted condition away from said seat to increase the distance thereof from said seat and thereby move the tubular member against the urging of said biasing means,

F. the cross sectional configuration of the interior of the passageway and that of the rod each being uniform along a substantial portion of the axial length of both where they are opposite one another during movement of said tubular member,

G. the penetration of the rod into the passageway comprising a fluid resistance section in the flow of fluid through the housing in the said fluid flowing space between rod and passageway whose fluid resistance varies linearly with the pressure drop between the said inlet chamber and the outlet port and with the axial movement of the said tubular member and

H. said tubular member having means for providing an

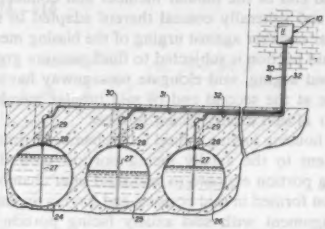
indication externally of said housing of the amount of movement of said tubular member.

4,064,752

REMOTE MULTIPLE TANK LIQUID LEVEL MEASURING DEVICE

Frank W. Murphy, Jr., Bixby, and Buddy G. Sparks, Tulsa, both of Okla., assignors to Frank W. Murphy Manufacturer, Inc., Tulsa, Okla., a part interest

Filed Oct. 21, 1976, Ser. No. 734,658
Int. Cl.[2] G01F *23/14*
U.S. Cl. 73—302 **1 Claim**



1. A liquid level monitoring apparatus for plural remote underground storage tanks at an automobile service station comprising in combination a lockable steel security box for mounting on an interior wall of an automobile service station office, a pressure responsive measuring gage within the security box and having a dial calibrated in linear depth units of liquid product in said underground storage tanks, said gage being common to all of said tanks, a hand-operated rotary selector valve within the security box and having a rotary tank selector handle and a coacting indicia plate indicating tank selector positions for the handle, plural conduits connected with the rotary selector valve and anchored to and extending through a wall of the security box and terminating at locations near the bottoms of said underground tanks, the rotary selector valve having an inlet, a hand-operated elastic squeeze bulb having a one-way check valve and serving as an atmospheric air pump, said check valve closing when said squeeze bulb is compressed and opening during expansion of the squeeze bulb to admit atmospheric air, a conduit interconnecting said rotary selector valve inlet with said pressure responsive gage, a T-coupling in the last-named conduit and connected with the elastic squeeze bulb, whereby atmospheric air can be pumped simultaneously to the gage and selector valve inlet, said rotary selector valve being operable to place one underground tank at a time in fluid communication with said gage through one of said first-named conduits while blocking fluid communication between the other tanks and said gage.

4,064,753

RF ADMITTANCE MEASURING METHOD AND APPARATUS FOR DETERMINING THE LEVEL OF A CONDUCTIVE LIQUID

Robert J. Sun, Bala Cynwyd, and Frederick L. Maltby, Jenkintown, both of Pa., assignors to Drexelbrook Controls, Inc., Horsham, Pa.

Filed Dec. 12, 1974, Ser. No. 532,208
Int. Cl.[2] G01F *23/26, 11/20*
U.S. Cl. 73—304 C **40 Claims**

1. A probe system for measuring the level of a substantially conductive liquid in a vessel, said probe system comprising:

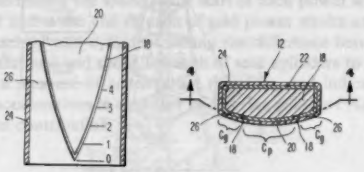
a probe adapted to be mounted on a surface of said vessel so as to extend through the surface level of said liquid said probe including

a conductive probe electrode extending longitudinally along the probe adjacent the front thereof and away from said surface,

conductive guard electrode means extending longitudinally along the probe, said guard electrode means including lateral portions extending laterally outwardly from a portion of said probe electrode;

interior solid insulation means supporting said probe electrode and said guard electrode means; and

exterior solid insulation means covering said conductive probe electrode and said guard electrode means so as to provide an external surface in contact with the conductive liquid, such that said lateral portions are substantially as closely coupled to the surface as said probe electrode is coupled to the surface, said lateral portions extending laterally outwardly beyond said portion of said probe electrode a distance at least six times greater than the thickness of said solid insulation means covering said guard electrode means divided by the dielectric constant of the solid insulation means; and



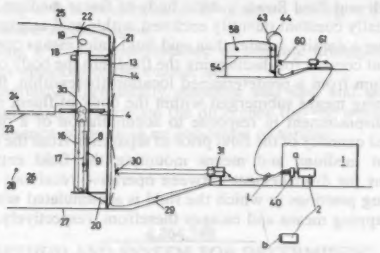
means for maintaining the potential of said guard electrode means at substantially the same potential as said probe electrode.

4,064,754

METHOD FOR MEASURING THE FILLING LEVEL IN CONTAINERS AND APPARATUS FOR PERFORMING THE METHOD

Markus Frey, Zurich, Switzerland, assignor to ITO-Patent AG, Zurich, Switzerland

Filed Dec. 29, 1976, Ser. No. 755,270
Int. Cl.[2] G01F *23/10, 23/12*
U.S. Cl. 73—313 **19 Claims**

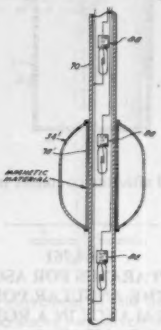


1. An apparatus for measuring the filling level of a liquid in a container, comprising a light source, first and second reflecting means, said first reflecting means being positioned in said container, means for floating said second reflecting means in said container, an optical reference path extending between said source and said first reflecting means, an optical measuring path extending between said source and said second reflecting means, said measuring path comprising a non-solid light conductive path extending at least between a fixed position in said container and said second reflecting means, and means for measuring the difference in propagation time of light from said source in said first and second paths.

4,064,755
LIQUID LEVEL SENSOR

Edgar A. Bongort, Southfield, and William T. Cruickshank, Pontiac, both of Mich., assignors to B/W Controls, Inc., Birmingham, Mich.

Division of Ser. No. 627,518, Oct. 31, 1975. This application Jan. 12, 1977, Ser. No. 758,568
Int. Cl.[2] G01F *23/12;* H01H *36/00*
U.S. Cl. 73—313 7 Claims

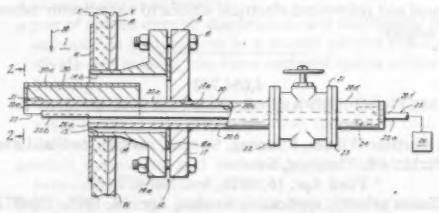


1. A liquid level sensor comprising, in combination:
a guide tube for vertical positioning in the liquid whose level is to be sensed;
a float externally surrounding the guide tube for longitudinal movement thereon to rise and fall with the liquid level and having a portion of magnetic material of low residual magnetism encircling the guide tube;
a reed switch in the guide tube having reeds of low residual magnetism extending substantially parallel to the axis of the guide tube;
a bias magnet in the guide tube adjacent one end of the reed switch with the magnet poles facing in opposite directions longitudinally of the guide tube; and
said portion of magnetic material on the float functioning as a field conductor for the magnetic field of the bias magnet causing the switch reeds to open and remain open as the float passes by them moving in one direction, and close and remain closed as the float passes them moving in the opposite direction.

4,064,756
INSTRUMENT ASSEMBLY

John P. MacLean, Stafford, and John C. Strickland, Houston, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,279
Int. Cl.[2] G01K *13/02*
U.S. Cl. 73—349 7 Claims



1. An instrument assembly adapted for mounting on a vessel for indicating a condition therein, comprising:
a flange assembly mounted in a wall of such vessel;
a hollow mounting tube mounted on said flange assembly for extending through an opening in the wall of such vessel into the interior thereof;
a condition-sensitive means positioned in a thermowell in said mounting tube for extending through an opening in the wall of such vessel;
said mounting tube being a preselected thickness and having an opening on the downstream side thereof for positioning within said vessel downstream of any fluid flow therethrough, said condition-sensitive means being exposed to fluid of said fluid flow through said downstream opening in said mounting tube to the interior of such vessel; and
a shield having a width of at least equal to the diameter of said mounting tube and securedly mounted on said mounting tube opposite from said mounting tube opening for being positioned upstream of any fluid flow in such vessel having a solid surface on the upstream side of said mounting tube for diverting all fluid flow around said mounting tube for preventing erosion of the mounting tube and of the condition-sensitive means therein for at least partly projecting said condition-sensitive means from deleterious effects of fluid flow through such vessel while obtaining accurate information of the fluid condition therein.

4,064,757
GLASSY METAL ALLOY TEMPERATURE SENSING ELEMENTS FOR RESISTANCE THERMOMETERS

Ryusuke Hasegawa, Morristown, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 18, 1976, Ser. No. 733,628
Int. Cl.[2] C22C *16/00, 25/00;* G01R *19/00*
U.S. Cl. 73—362 AR 18 Claims

1. A temperature sensing element, comprising for low temperature resistance thermometers
a. a body of a metal alloy that is at least 50% glassy having a composition consisting essentially of about 20 to 45 atom percent beryllium, about 2 to 80 atom percent zirconium, about 0.5 to about 2 atom percent of at least one metal selected from the group consisting of vanadium, chromium, manganese, iron, nickel and cobalt, and the balance essentially titanium and incidental impurities; and
b. electrically conductive leads attached thereto.

13. In a process for measuring low temperatures which comprises measuring a signal generated by a temperature sensing element of a resistance thermometer which is electrically connected to a temperature indication means, the improvement which comprises employing as the temperature sensing element a body of metal alloy that is at least 50% glassy having a composition consisting essentially of about 20 to 45 atom percent beryllium, about 2 to 80 atom percent zirconium, about 0.5 to about 2 atom percent of at least one metal selected from the group consisting of vanadium, chromium, manganese, iron, nickel and cobalt, and the balance essentially titanium and incidental impurities.

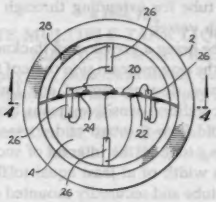
4,064,758
PRESSURE TRANSDUCER STRUCTURE

Arthur Michael Harrison, Los Angeles, Calif., assignor to Micron Instruments, Los Angeles, Calif.

Filed Oct. 13, 1976, Ser. No. 731,546
Int. Cl.[2] G01L *9/06*
U.S. Cl. 73—398 AR 7 Claims

1. A pressure transducer structure for a pressure transducer of the type comprising a hollow transducer housing, a diaphragm provided in one end of said housing, a plurality of strain sensors provided in said housing and a connecting cable, the improvement comprising:
a bowed, flexible elongated non-conductive board having two ends provided in said housing adjacent said strain

sensors and engaging the inside surface of said housing at both ends of said board; and



a plurality of conductors provided in said board for electrically coupling said strain sensors at one end of said conductors and said cable at the other end of said conductors.

4,064,759

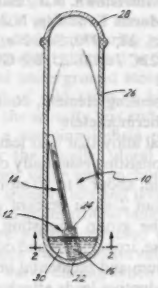
PRESSURE MEASURING DEVICE

Charles Koehler, 184 Pebble Ridge Road, Warrington, Pa. 18976

Filed Nov. 26, 1976, Ser. No. 744,991

Int. Cl.[2] G01L *7/02*

U.S. Cl. 73—409 **9 Claims**



1. A pressure-measuring device comprising a closed glass member including a hollow pressure-sensing portion and a hollow pressure-indicating portion communicating with said pressure-sensing portion, said pressure-sensing portion being a generally rectangular container including a first pair of opposite walls having a width significantly greater than the width of a second pair of opposite walls, said container being filled with an incompressible fluid whereby when said glass member is placed in a pressurized medium said first pair of walls deform causing displacement of said incompressible fluid to provide an indication of the pressure of the medium.

4,064,760

STERILE URINE COLLECTION DEVICE

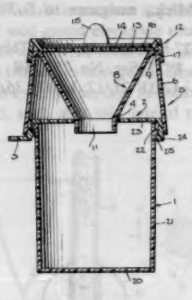
Thomas A. Benjamin, Glen Gardner, N.J., assignor to IPCO Hospital Supply Corporation, White Plains, N.Y.

Filed Dec. 15, 1976, Ser. No. 750,591

Int. Cl.[2] G01N *1/20*

U.S. Cl. 73—421 R **21 Claims**

1. A urine collection device comprising a container, a lid closing said container, a funnel assembly mounted over said lid, said lid having an opening therein, said funnel assembly having a funnel member extending through the opening in the lid, a funnel cover mounted over the funnel assembly, a seal removably mounted on the device, said seal being adapted to be removed from the device and to be affixed to the lid to close



the opening in the lid after the container is used and the funnel removed.

4,064,761

METHOD AND APPARATUS FOR ASCERTAINING AND INDICATING THE ANGULAR POSITION OF AN UNBALANCE IN A ROTOR

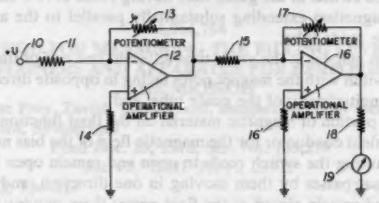
Alfred Giers, Rossdorf; Paul Holdinghausen, Bickenbach; Hatto Schneider, Heppenheim-Kirschhausen, and Friedhelm Widmann, Seeheim, all of Germany, assignors to Firma Carl Schenck AG, Darmstadt, Germany

Filed Oct. 28, 1976, Ser. No. 736,372

Claims priority, application Germany, Oct. 31, 1975, 2548729

Int. Cl.[2] G01M *1/22, 1/08*

U.S. Cl. 73—462 **19 Claims**



1. A method for indicating the angular position of an unbalance in a rotary body to be balanced in a balancing machine, comprising ascertaining the angular position of the unbalance with respect to a reference on the body, in the form of an angular position representing electrical signal, transforming said angular position representing electrical signal to correspond to linear measurement units which are automatically referenced to the circumference of the body to be balanced, whereby these measurement units are transferrable to the circumference of the rotary body, and supplying said transformed and referenced electrical signals to an indicator means for display.

4,064,762

METHOD AND APPARATUS FOR BALANCING A ROTOR

Jan Christer Wikner, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Apr. 16, 1976, Ser. No. 677,651

Claims priority, application Sweden, Apr. 28, 1975, 7504871

Int. Cl.[2] B25B *19/00;* **G01M** *1/32*

U.S. Cl. 73—487 **2 Claims**

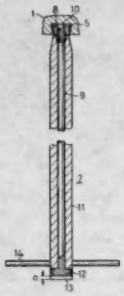
1. A method of balancing a rotor comprising the steps of:

removably attaching a balance weight to one end of an insertion rod, said insertion rod being slideably received in

a sleeve, said sleeve bearing on said balance weight and extending beyond the other end of said insertion rod a predetermined distance;

inserting said balance weight into a recess in said rotor at a preselected location therein;

striking said sleeve against said balance weight to upset the material of said balance weight into said recess;



visually observing movement of said sleeve along said insertion rod until said sleeve has moved through said predetermined distance and the ends of said sleeve and said insertion rod are aligned to obtain a desired upsetting of said balance weight and then stopping said striking; and

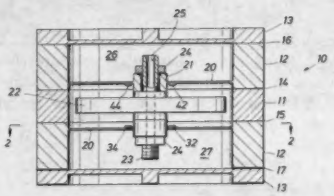
removing said insertion rod from said balance weight, leaving said balance weight in said recess.

4,064,763

ACCELEROMETER FOR MEASURING PUMP ROD DISPLACEMENT

Krishnaswamy Srinivasan, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 1, 1976, Ser. No. 737,306
Int. Cl.[2] G01P *15/12*
U.S. Cl. 73—516 R **8 Claims**



1. An accelerometer for measuring low amplitude, low frequency accelerations along one axis and discriminating against acceleration along axes at right angles to said one axis; said accelerometer comprising:

a closed cylindrical housing;

a pair of spaced circular diaphragms, said diaphragms being mounted in said housing in a spaced parallel relation to divide said housing into three enclosed spaces within said housing;

a weighted member, said member being disposed in the space between said diaphragms and fastened to both said diaphragms;

conduit means disposed to provide fluid communication between the other two spaces;

a plurality of strain gages, at least one of said strain gages being mounted on each of said diaphragms with their sensitive axis disposed in a radial direction; and

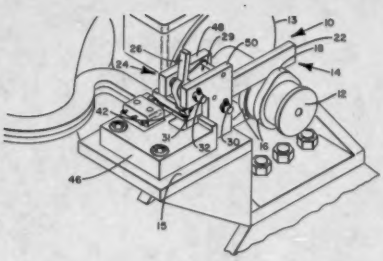
circuit means, said strain gages being coupled to said circuit means in a manner to cancel response along axes transverse to the axis of said cylindrical housing.

4,064,764

TRIP DEVICE FOR A ROTATING MACHINE

George P. Schanzenbach, Jr., Reading, and David M. Mizikar, Mount Pleasant, both of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 4, 1976, Ser. No. 683,135
Int. Cl.[2] F16P *7/02*; F16C *41/00*
U.S. Cl. 74—2 **9 Claims**



1. A trip device to discontinue operation of a machine upon the occurrence of an undesirable operating condition comprising:

means to sense the occurrence of said undesirable operating condition;

a first operating arm spaced from said sensing means during normal operation of said machine, said sensing means moving into contact with said arm upon the occurrence of said undesirable operating condition; and

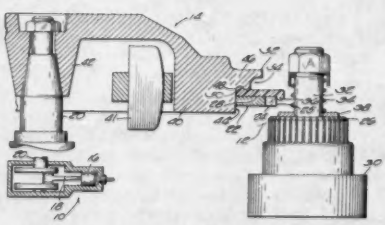
trigger means to lock said operating arm in said normal operating position, said sensing means moving said arm relative to said trigger means upon the occurrence of said undesirable operating condition, said trigger means thereafter acting as a stop to maintain said operating arm in a position spaced from said sensing means.

4,064,765

FLYWHEEL ASSEMBLY RING GEAR GUARD

Edward D. McBride, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 18, 1976, Ser. No. 733,036
Int. Cl.[2] F02N *11/10, 15/10*
U.S. Cl. 74—6 **24 Claims**



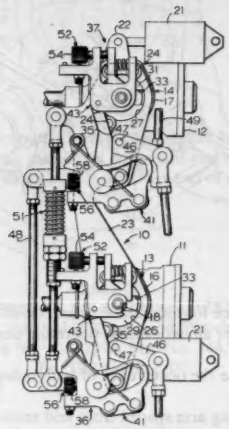
1. A flywheel assembly adapted for use with an engine, said flywheel assembly comprising a ring gear including teeth adapted for engagement with a starter pinion, and a flexible member extending adjacent said ring gear teeth to prevent access to said ring gear teeth by an engine operator.

4,064,766

MODULAR CONTROL LINKAGE ASSEMBLY FOR A HYDROSTATIC TRANSMISSION

James D. Rinaldo, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 15, 1977, Ser. No. 806,804
Int. Cl.[2] G05G 11/00; F15B 13/09
U.S. Cl. 74—473 R 5 Claims



1. A modular control linkage assembly for a hydrostatic transmission having a pair of variable displacement overcenter hydraulic pumps and first and second rotary servo valves, each servo valve having a housing connected to the respective pump and a valve spool rotatably positioned within the housing for controlling the output displacement of the respective pump, comprising:

a mounting plate extending between and releasably connected to said housings of the first and second servo valves;

first means connected to the valve spool of the first servo valve for selectively rotating said first servo valve spool, said first means being mounted on said mounting plate adjacent said first servo valve spool;

second means connected to the valve spool of the second servo valve for selectively rotating said second servo valve spool, said second means being mounted on said mounting plate adjacent said second servo valve spool; and

third means interconnecting said first and second means for causing simultaneous rotation of said valve spools in response to a single input signal to one of the first and second means.

4,064,767

CONTROL LEVER ASSEMBLY

Richard F. Boersma, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Nov. 8, 1976, Ser. No. 740,134
Int. Cl.[2] G05G 1/04, 1/14
U.S. Cl. 74—491 10 Claims

1. A control lever assembly adapted to be mounted on a panel for actuating a controlled function, comprising

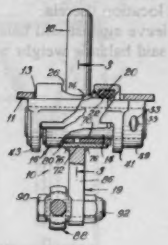
a mounting bracket adapted to be mounted to one side of said panel over an opening therein,

a pivot pin fixed to said bracket and having its axis disposed in a plane parallel to the plane of said opening,

bearing means surrounding said pin and journalled for rotation thereon to rotate about said pivot pin axis,

a handle fixed to said bearing means for movement thereof and extending through said opening with a distal end portion being disposed on the opposite side of said panel,

a centrally-apertured, flexible seal member surrounding said handle and disposed between said bearing means and said bracket for sealing said assembly to said one side of said panel, and



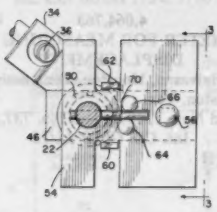
a control linkage extending from said bearing means on said one side of said panel to the controlled function for movement with said handle for actuating said controlled function.

4,064,768

DETENT MECHANISM WITH ARC TRAVEL LIMITER

Spencer E. Smith, Western Springs, and Donald C. Marek, Hickory Hills, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 29, 1976, Ser. No. 745,886
Int. Cl.[2] G05G 5/06; B60K 20/06, 20/08
U.S. Cl. 74—528 7 Claims



1. A detent mechanism comprising:

a fixed detent platform having an aperture therethrough, first and second upwardly extending tabs and first and second protuberances formed in said detent platform on arcuate paths between said tabs;

a rotatable control rod passing through said aperture of said detent platform, said control rod having a transverse appendage extending outward from said control rod in contact with the top surface of said detent platform between said first and second upwardly extending tabs;

a biasing means carried on said control rod to urge said transverse appendage into contact with the detent platform whereby said first and said second tabs absolutely limit the arcuate travel of said control rod through contact with said transverse appendage and said first and second protuberances impede the arcuate travel of said control rod through spring loaded contact with said transverse appendage.

4,064,769

CONTROL PEDAL-MECHANICAL SPEED WITH ELECTRICAL DIRECTION CONTROL

John K. Amdall, Peoria, and Gerald P. Simmons, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 24, 1975, Ser. No. 634,949
Int. Cl.[2] G05G 13/00
U.S. Cl. 74—878 6 Claims

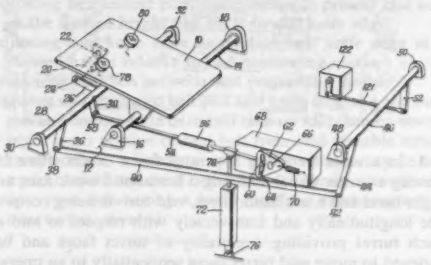
1. A control linkage for combined simultaneous control of an

engine throttle and a transmission control valve ratio selector element from a single pedal, comprising:

a single foot pedal mounted for pivotal movement a about a first axis from a zero position in a first direction through a control range of selectively variable throttle positions and transmission drive ratios, said pedal having a surface for receiving an operator's foot which surface is fixed against pivoting movement about any axis other than said first axis;

throttle linkage means mechanically linking said engine throttle to said single pedal for causing proportionate movement of said throttle through said control range as said pedal is pivoted in said first direction; and

transmission ratio control linkage means for selectively linking said transmission control valve ratio selector element to said single foot pedal for proportional movement



therewith through said control range, said ratio control linkage means including shifting means for shifting said ratio control linkage means to a first position, in response to placement of said operator's foot at a first location on said pedal surface, for proportional movement of said control valve ratio selector element in a forward direction upon movement of said foot pedal in said first direction and for shifting said linkage to a second position, in response to placement of said operator's foot at a second different location on said pedal surface, for proportional movement of said control valve ratio selector element in a reversed direction upon movement of said foot pedal in said first direction, and for maintaining said control valve ratio selector element stationary upon pivoting of said pedal in said forward direction in response to placement of said operator's foot at a third location on said pedal surface.

4,064,770

MACHINE FOR SHARPENING BAND SAW TEETH

Vladimir Viktorovich Idel, ulitsa Gertseana, 3, kv. 37, Zavolzhie Gorkovskoi oblasti, U.S.S.R.

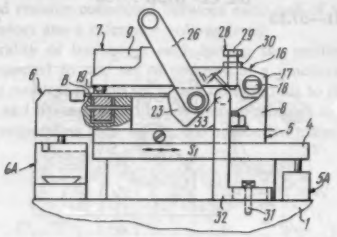
Continuation of Ser. No. 556,539, March 7, 1975, abandoned. This application June 21, 1976, Ser. No. 698,134

Claims priority, application U.S.S.R., June 24, 1974, 2032128; June 24, 1974, 2032129

Int. Cl.² B23D *63/12*

U.S. Cl. 76—37 **1 Claim**

1. A machine for sharpening band saw teeth comprising: a base; a sharpening mechanism with a grinding wheel mounted on said base; means for feeding a saw to the grinding wheel for sharpening edges of the adjacent saw teeth mounted on said base; means for pitch feed of the saw relative to the grinding wheel mounted on said means for feeding the saw to the grinding wheel; said means for feeding the saw to the grinding wheel being connected to said means for pitch feed of the saw; a resilient clamping means for supporting the saw in a floating position, said resilient clamping means being mounted on said means for feeding the saw to the grinding wheel; at least two support members mounted on said resilient clamping means for successively engaging the addendum of each tooth of the saw; one of said support members being mounted before the grinding wheel in the direction of the pitch feed of the saw; the other support member being mounted behind the grinding wheel in the direction of the pitch feed of the saw; means for braking the saw including a pressure member in intermittent contact with the side surface of the saw, said pressure member being mounted adjacent to said one support member mounted



before the grinding wheel in the direction of the pitch feed of the saw; a stop adjustably mounted on said means for braking the saw; a cam adjustably mounted on said base; and said stop cooperating with said cam during the sharpening of edges of the adjacent saw teeth, whereby the saw is released from braking.

4,064,771

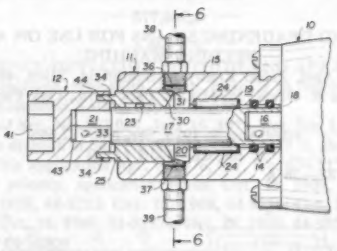
AUTOMATIC TORQUE CONTROLLER FOR AN IMPACT WRENCH

Adrian H. Krieg, 2627 Dunning Drive, Yorktown, N.Y. 10598

Filed Mar. 10, 1977, Ser. No. 776,280

Int. Cl.² B25B *19/00*

U.S. Cl. 81—52.3 **10 Claims**



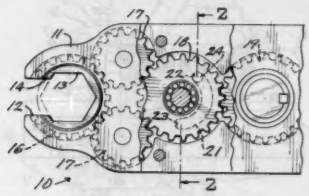
1. A torque controller for use in pneumatic impact wrenches comprising a main housing having a first end wall and a second end wall, an inlet opening for compressed air, and an outlet opening for the exhaust of the compressed air; a shaft rotatably mounted between said first and second end walls having an opening formed in its end near said first end wall for receiving a driving member of an impact wrench, and a driving projection formed near said second end wall for driving engagement with a socket tool; and a sliding member mounted for slidable movement relative to said shaft, said sliding member comprising a base portion mounted around said shaft, said sliding member having groove engaging means mounted at its end near said second end wall for engagement with a groove in a socket tool, said sliding member being slidable to and away from said first end wall and forming therebetween a chamber, said chamber receiving compressed air from said inlet opening and exhausting compressed air by said outlet opening.

4,064,772

TUBING WRENCH WITH AIR POWERED RETURN

H. Edward Boyd, Euclid, Ohio, and Thomas M. Freiburger, San Rafael, Calif., assignors to Cooper Industries, Inc., Houston, Tex.

Filed July 6, 1976, Ser. No. 703,065
Int. Cl.[2] B25B 17/00
U.S. Cl. 81—57.13 7 Claims



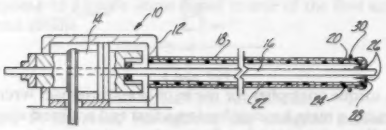
1. In a power driven tubing wrench having an air motor, a throttle valve for selectively admitting and shutting off a flow of pressurized air to the air motor, a spool valve for controlling the direction of rotation of the air motor by selectively and alternately linking the inlet and exhaust sides of the air motor with pressurized air and the exterior of the tool, a housing extending forward from the air motor and including a forward end with a circular opening therethrough and a radial slot therein, a generally annular, radially slotted fastener driving socket member rotatably positioned within the forward end of the housing, a driving connection between the motor and the socket member, and means for stopping the reverse rotation of the socket member at a position wherein the radial slots of the forward housing end and of the socket member are in alignment, the improvement, comprising a unitary spool and throttle valve stem axially movable from a first position opening to admit air flow to the inlet side of said motor, to a second position to shut off the inlet side of said motor and admit air flow to the exhaust side of said motor and thence to a third position of no air flow.

4,064,773

SOUND DEADENING MEANS FOR USE ON A BAR FEEDING MACHINE

Fred B. Apel, 22560 Kenwyck, Southfield, Mich. 48076, and Jerome B. Olson, 15341 Oak Park Blvd., Oak Park, Mich. 48237

Filed Aug. 9, 1976, Ser. No. 712,686
Int. Cl.[2] B23B 13/00
U.S. Cl. 82—38 A 8 Claims



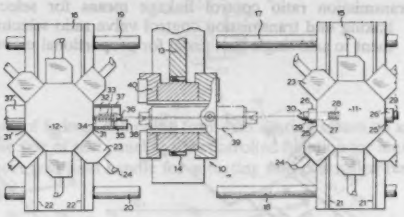
1. In combination with a machine of the type which operates upon a bar from which a work article is formed and including a feed tube through which the bar is fed, said tube having a first end positioned to feed the bar to said machine and a second, opposite end exposed for axially receiving the bar, sound deadening means comprising a non-metallic tubular cylindrical member adapted to fit within said tube and having an inside diameter larger than the diameter of said bar and at least one end of said member extending outwardly from said second end of said tube, a portion of said outwardly extending end of said sound deadening member being folded back upon itself to form an enlarged diameter portion having a circumferential edge which abuts said second end of said tube to prevent said sound deadening means from being moved axially inwardly into said tube with said bar.

4,064,774

WORK HANDLING APPARATUS FOR CENTER DRIVE LATHE

William Harvard Maddock, Weston, Canada, assignor to Standard Modern Tool Company Limited, Toronto, Canada

Filed Dec. 8, 1976, Ser. No. 748,548
Int. Cl.[2] B23B 15/00
U.S. Cl. 82—45 6 Claims



1. In a work handling apparatus for a center drive lathe having a center chuck defining a horizontal work axis, and a right hand and a left hand turret, said turrets being reciprocable longitudinally and transversely with respect to said axis, each turret providing a plurality of turret faces and being indexed to move said turret faces sequentially to an operative position, the improvement comprising:

first and second work supporting centers mounted respectively on said right hand and left hand turrets, each work supporting center having a tapered nose and an elongated body portion extending therefrom,

at least one face of each turret providing mounting means engaging the body portion of the respective work supporting center for locating the work supporting center coaxially with the chuck in the operative position of said one face,

said mounting means including, respectively, first and second spring biasing means engaging said first and second work supporting centers for biasing said centers axially inwardly towards the chuck,

the second spring biasing means being weaker than the first spring biasing means, and

a work locating jig mounted on said left hand turret and extending axially from said one face thereof when said one face is in the operative position,

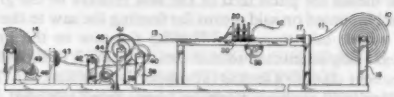
the jig providing an abutment shoulder engageable with a workpiece carried between said centers for locating the workpiece axially with respect to the chuck.

4,064,775

METHOD AND APPARATUS FOR REPAIRING CONVEYOR BELTS

Robert L. Larson, Des Plaines, Ill., assignor to Regis Belt Maintenance Corporation, Chicago, Ill.

Filed Jan. 19, 1976, Ser. No. 650,497
Int. Cl.[2] B26D 3/28
U.S. Cl. 83—4 2 Claims



1. A method of refinishing a linear worn conveyor belt by splitting the worn conveyor into a worn portion and a structural portion, and securing a new surface on said structural portion; said method comprising the steps of:

mounting a conveyor belt between a feed roll and a take-up roll in a position for continuous feeding of said belt at a desired height and attitude, said belt having a worn portion and a structural portion, positioning an adjustable knife edge in the path of the belt between said rolls, said knife edge being fixed relative to the travel of said belt;

making an initial cut across the width of a leading edge of the belt;

feeding said leading edge of the belt past a first stationary positioning means, said first positioning means orienting said belt in a desired attitude;

drawing said leading edge of said belt over a second positioning means spaced from said first positioning means, said second positioning means adjustable to present said leading edge at a desired height to said knife edge;

allowing the upper portion of said belt to move freely between said first positioning means and said knife edge;

adjusting said second positioning means to present said belt at the desired height and angle to said knife edge;

adjusting said knife edge to position said knife edge at a desired height relative to said positioning means;

tensioning said belt between said positioning means;

drawing said tensioned belt past said knife edge at a continuous and uniform rate onto said take-up roll, thereby severing a worn portion of said belt from said reusable structural portion, whereby a new upper surface may be secured on said structural belt portion to obtain a resurfaced conveyor belt having a highly uniform thickness and a new surface thereon.

4,064,776

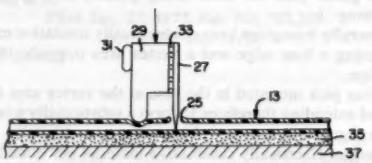
APPARATUS FOR MAKING TEAR RESISTANT SEPARABLE END-CONNECTED BAGS

Charles R. Walitalo, Matteson, and Alvin E. Ericson, Chicago, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 527,430, Nov. 26, 1974, abandoned. This application June 15, 1976, Ser. No. 696,297

Int. Cl.[2] B26D *7/10*

U.S. Cl. 83—171 **2 Claims**



1. Apparatus for forming discontinuous annealed edged perforations separated by tabs in flexible plastic film sheet material comprising, in combination, a serrated edged cutting blade having recesses disposed at spaced intervals extending into the blade from its cutting edge to beyond its cutting edge, said recesses being disposed at the apexes of crevices in the serrated edge of the blade, and means to heat the blade to a preselected temperature lower than the melting temperature of the plastic film sheet material in process, at which temperature the material will anneal.

4,064,777

CIRCUIT FOR PREFERENTIALLY SELECTING HIGHEST AND LOWEST TONES

Keiji Akamatsu, Osaka, Japan, assignor to Roland Corporation, Japan

Filed Aug. 26, 1976, Ser. No. 718,195

Claims priority, application Japan, Sept. 8, 1975, 50-109318

Int. Cl.[2] G10H *1/00, 5/06*

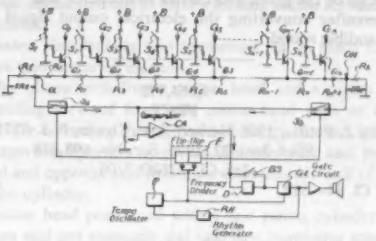
U.S. Cl. 84—1.03 **4 Claims**

1. In an electronic keyboard musical instrument, a circuit for preferentially selecting the highest and the lowest tones from among the tones in chords produced by keys on the keyboard which have been struck, said circuit comprising:

a set of resistors having equal value connected in series, the number of resistors in said set being one more than the number of tones from which the highest and lowest tones are to be selected;

an end resistor connected between each end of said set of resistors and a reference voltage level;

a plurality of transistors each having the emitter thereof connected to said set of resistors at a junction between two resistors of said set which corresponds to the transistor and having the collector thereof adapted to receive a corresponding tone signal, the number of transistors corresponding to the number of tones from which the highest and lowest tones are to be selected;



a plurality of keyswitches, one connected to the base of each transistor and to a bias source, for connecting the base of the transistor to said bias source when the corresponding tone is played;

two switch means, one connected between each end of said set of resistors and the corresponding end resistor;

means connected to said switch means for alternately opening and closing said switch means in synchronism; and

shaping and amplifying means coupled to said switch means for alternately receiving signals from opposite ends of said set of resistors through said switch means and for producing an output of uniform amplitude.

4,064,778

FREQUENCY-DEVIATION METHOD AND APPARATUS

Yasuji Uchiyama, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

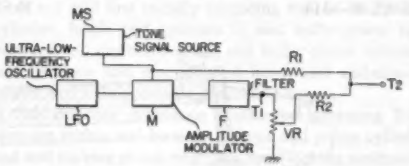
Division of Ser. No. 163,034, July 15, 1971, Pat. No. 3,973,462, which is a division of Ser. No. 81,011, Oct. 15, 1970, abandoned. This application Apr. 7, 1976, Ser. No. 674,317

Claims priority, application Japan, Oct. 15, 1969, 44-8212; Oct. 15, 1969, 44-8213; Oct. 15, 1969, 44-8214; Oct. 15, 1969, 44-8215; Oct. 16, 1969, 44-98574; Oct. 16, 1969, 44-98575; Oct. 17, 1969, 44-98804

The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.25 **3 Claims**



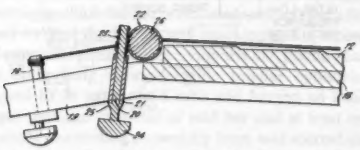
1. A method for electronically generating an audible sound exhibiting a tremolo effect, said method comprising the steps of:

providing an electrical musical tone signal of a given frequency;
providing an electrical carrier signal of a frequency lower than said given frequency;
generating an amplitude modulated electrical signal by electronically varying the amplitude of the carrier signal in accordance with the amplitude of the tone signal of said given frequency;
electronically removing the carrier signal frequency from the modulated signal;
electronically inserting the musical tone signal of said given frequency into the modulated signal to produce an electrical output signal consisting of frequency components of the given frequency, the sum and the difference frequencies of the given and carrier frequencies; and
thereafter converting the electrical output signal into an audible sound.

4,064,779
FRET
Phillip J. Petillo, 1206 Herbert Ave., Ocean, N.J. 07712
Filed June 22, 1976, Ser. No. 698,318
Int. Cl.[2] G10D *3/06*
U.S. Cl. 84—314 **5 Claims**

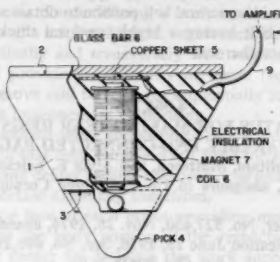
1. A fret adapted for insertion in the neck of an instrument having one or more strings disposed a predetermined height above the surface of said neck comprising:
an elongated stem adapted to engage said neck for mounting purposes, said stem having a central axis passing longitudinally through its long axis, and
a cap for engaging a string when said string is deflected toward said neck by a player's finger, said cap having a base centrally attached to one end of said stem and two sides converging above said base (so as to intersect) and intersecting at said central axis and at least one side lying in a spacial segment defined on one border by said base and on the other border by a straight line diverging towards said central axis from a point of intersection with the end of said base.

4,064,780
STRINGED INSTRUMENTS
Andrew Bond, 38 Courthill Road, Parkstone, Poole, Dorset, England
Filed Aug. 18, 1975, Ser. No. 605,502
Claims priority, application United Kingdom, Nov. 26, 1974, 51247/74; May 29, 1975, 23464/75
Int. Cl.[2] G10D *3/06, 3/04*
U.S. Cl. 84—314 **16 Claims**



1. A fretboard adapted to be fitted to the neck of a stringed instrument, the fretboard comprising a unitary, elongate body having first and second longitudinally spaced ends to be arranged adjacent the body and head ends, respectively, of a stringed instrument, and a plurality of integrally formed frets in the normal fret positions, said frets comprising transversely extending crests of a plurality of triangular shaped ridges arranged in succession along a surface of said body from said first end to said second end, each said ridge comprising a relatively short side inclined substantially at right angles to the longitudinal axis of said body and a relatively long, substantially planar side sloping from the top of said short side to the base of the short side of the next following ridge in the direction of said second end, the top of each said short side where it meets its associated relatively long side, being rounded with the center of curvature located on an imaginary line extending substantially at right angles to the longitudinal axis of said body and passing through the crest of the associated ridge, at least the crest of each ridge having a hard, wear resistant surface.

4,064,781
GUITAR PICK
Henry J. Fals, Vacaville, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Nov. 10, 1976, Ser. No. 740,593
Int. Cl.[2] G10D *3/16, 5/00*
U.S. Cl. 84—322 **3 Claims**

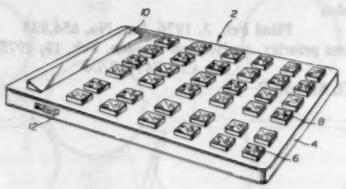


1. A guitar pick for steel string guitars, said guitar pick comprising
a generally triangular base of electrically insulative material having a base edge and a vertex area opposite the base edge;
a guitar pick mounted in the base at the vertex area thereof and extending therefrom to form a substantially triangular configuration;
a sheet of electrically conductive material embedded in the base in spaced parallel proximity with the base edge thereof;
microphone means embedded in the base and extending between the pick and the sheet of electrically conductive material and in close proximity with each; and
electrically conductive means electrically connected to the microphone means and the sheet in the base and extending out of the base for connection to an amplifier.

4,064,782
ELECTRONIC MUSIC DISPLAY DEVICE
Daniel Laflamme, 157 Desmarchais Boulevard, Verdun, Quebec, Canada
Filed May 6, 1976, Ser. No. 683,860
Int. Cl.[2] G09B *15/02;* **G10C** *3/12*
U.S. Cl. 84—477 R **10 Claims**

1. An electronic digital display device for identifying musical notes which comprises:
1. a series of manually operable on-off key selector switches, mounted on a portable frame, one key selector switch associated with each desired key and so identified, each said key selector switch being of a type which does not permit simultaneous operation of two or more key selector switches in the "on" position;

2. a series of manually operable on-off note selector switches mounted on the frame, one note selector switch being associated with each desired note and so identified, each said note selector switch being simultaneously operable with any one or more other said note selector switches in the "on" position;
3. interval indicator means mounted on the frame and visually associated with said note and key selector switches;
4. a first circuit network portion comprising a plurality of circuit branches, one branch associated with each key selector switch, each of said circuit branches extending to



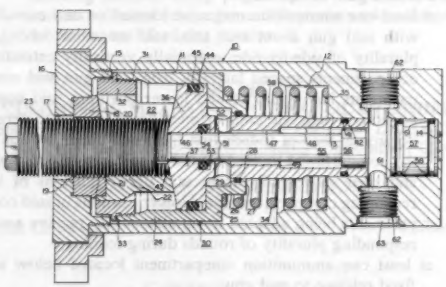
each of said note selector switches and being exclusively actuated by its associated key selector switch;
5. a second circuit network portion comprising a plurality of circuit branches, each corresponding to a branch of said first circuit portion at each of said note selector switches and each branch of said second circuit portion extending from each of said note selector switches to said interval indicator means, said first and second portions of said circuit network arranged so that a characteristic visual response is obtained from the interval indicator means for each note in a given key.

4,064,783

PRESSURE-BALANCED UNDERWATER STRUCTURAL RELEASE SYSTEM

John O. Ess, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,209
Int. Cl.[2] F16B *37/00*
U.S. Cl. 85—33 **8 Claims**



1. A pressure-balanced separation-nut device for releasably engaging a threaded element coaxial with the linear axis of the device which comprises:
a housing forming an internal cavity,
said internal cavity including first, second, third and fourth sections each of lesser diameter in successive order progressing toward the forward end of said housing, said fourth section forming an open end in said housing;
a base secured to the back end of said first section of said housing;
said base including an axial aperture therein;
a seat member secured to said base member coaxial therewith, extending into said cavity, and having an aperture with substantially the same diameter as the aperture in said base member;
a segmented threaded nut within said first section of said cavity juxtaposed said seat member and coaxial with said cavity in said housing;
a piston cylinder encircling said segmented nut;
said piston cylinder including an axially extending cylindrical portion and first and second transverse annular end walls extending radially inward, the second wall being forward of the first wall;
a piston ring secured to one end of said axially extending cylindrical portion of said piston cylinder between the inner surface of said piston cylinder and the outer surface of said segmented nut to form a locking means for said nut segments;
said piston ring locking said segmented nut in place to receive said threaded element;
a buffer piston including a piston head and a piston rod extending forward from said piston head with an axial aperture extending through said buffer piston and having a transverse aperture across its diameter near said piston head and opposite said first transverse annular wall of said piston cylinder;
said piston head positioned within said piston cylinder between said nut segments and said first transverse annular wall of said piston cylinder, said piston head having an outside diameter substantially equal to the inside diameter of said piston cylinder with a face contoured to that of said segmented nut adjacent thereto;
said piston rod extending through said second transverse annular wall of said piston cylinder and secured within said third cavity section of said housing coaxial therewith;
a space bounded by said piston rod, said piston cylinder, said second transverse wall of said piston cylinder and said buffer-piston head, said transverse aperture connecting with said space;
an ejecting rod coaxially positioned within said aperture in said buffer piston for relative movement therein for ejection of said threaded element, said ejecting rod having a head at the end thereof remote from said buffer-piston head;
an end-closure means within said fourth cavity section of said housing and positioned between said ejection rod and said open end in said housing, said end-closure means comprising a piston exposed to the surrounding medium, means for permitting axial movement of said end-closure means within said housing prior to and during release of the threaded element;
sealing means to prevent leakage between said buffer piston and said piston cylinder, between said piston head and said ejection rod, between said piston rod and said housing, and between said end-closure means and said housing; at least one opening in said housing for reception of a fluid source, said opening being located between said end-closure means and said piston rod;
a fluid confined within the space between said buffer-piston head and said first radially extending wall of said piston cylinder, inside said aperture in said buffer-piston rod, between said ejection rod and said buffer-piston cylinder, and between said ejection rod head, said end-closure means, and a fluidpressure generating means,
said fluid-pressure generating means for increasing fluid pressure within said housing to force said piston cylinder and said locking piston ring from their locking position to an unlocked position; and
whereby pressure of the surrounding medium is applied to said end-closure piston which applies pressure to said confined fluid to balance pressures on said piston cylinder created by free flooding of said housing.

4,064,784

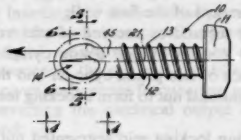
DRILL TIP AND THREADED FASTENER

Robert B. Adler, 6855 Cornell Road, Cincinnati, Ohio 45242

Continuation-in-part of Ser. No. 573,474, May 1, 1975, abandoned. This application Dec. 19, 1975, Ser. No. 642,664

Int. Cl.[2] F16B *25/00*

U.S. Cl. 85—41 16 Claims



1. A drill tip mounted on a shank comprising,

a pair of cutting elements,

each being one-half of a concave-convex spade-like element,

said elements being oppositely facing and integrally joined at the axis of said shank, the juncture of said elements forming a web in said tip,

each of said elements presenting an outboard curvilinear cutting edge which smoothly merges into said an arcuate pilot end, said curvilinear cutting edges and said arcuate pilot end forming a continuous curved cutting edge extending from one side of the shank to the diametrically opposite side thereof, said continuous cutting edge lying in a single plane generally parallel to the axis of said shank.

4,064,785

THREADED CONNECTIONS

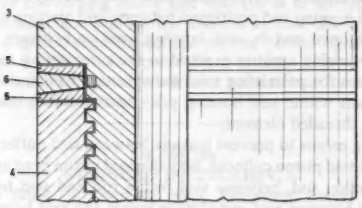
Peter Charles Graham, 9 Jasmyn Street, and Joseph Theo Renison, 9 Begonia Street, both of Welkom, South Africa

Filed Dec. 5, 1975, Ser. No. 638,088

Claims priority, application South Africa, Dec. 9, 1975, 75/7803

Int. Cl.[2] F16B *31/02*

U.S. Cl. 85—62 3 Claims



1. A break-out assembly in combination with a connection between interengaged screw-threaded male and female elements enabling the elements to be separated after being threadably engaged under stress, the assembly comprising a continuous annular washer of ductile material capable of developing hoop stress, said washer decreasing in thickness radially inwardly and having an internal diameter which is free fit around the male threaded element, and a pair of separate continuous annuli of relatively harder material than the washer, the annuli being complementally shaped to the washer and sandwiching the washer between them to form a right cylindrical ring which, when axial pressure is applied between its ends, places the washer under hoop stress, said annuli and washer having inner annular surfaces directly facing said male threaded element and forming clear annular gaps therewith, said gaps being devoid of any structure between said inner annular surfaces and said male threaded element, said inner annular surface of said washer being interposed between the annuli and holding the same apart in axially spaced relation such that when the annuli are axially stressed and the washer is under hoop stress, breakage of the washer unstresses the connection allowing the threaded elements to be separated.

4,064,786

METHOD AND DEVICE FOR AUTOMATIC AMMUNITION HANDLING

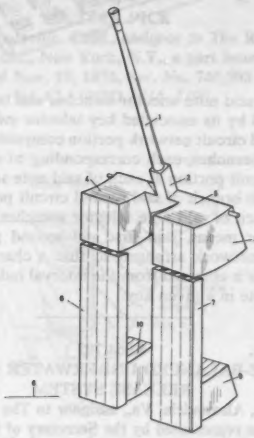
Tore Elwin, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Feb. 3, 1976, Ser. No. 654,833

Claims priority, application Sweden, Feb. 19, 1975, 7501823

Int. Cl.[2] F41F *9/04*

U.S. Cl. 89—33 B 3 Claims



1. Apparatus for handling rounds of ammunition for a gun, said gun being mounted for movement about a horizontal elevation axis, to load said gun in synchronism with the rate of fire of said gun, comprising:

at least one ammunition magazine located on and movable with said gun about said axis, said magazine having a plurality of side-by-side, essentially vertically extending compartments spaced laterally from said gun said compartments having upper and lower portions, said upper portion of each said compartment being located to permit horizontal feed of rounds first from said upper portion of the compartment located closest to said gun into said gun and then sequentially from said upper portions of the remaining compartments, said lower portions of said compartments being adapted to simultaneously receive a corresponding plurality of rounds during loading;

at least one ammunition compartment located below and fixed relative to said gun;

a plurality of side-by-side hoist means located in said at least one ammunition compartment for lifting a plurality of ammunition rounds with the axis of said rounds substantially parallel to the direction of movement from said at least one ammunition compartment and simultaneously depositing them in said lower portions of a corresponding plurality of said side-by-side compartments; and

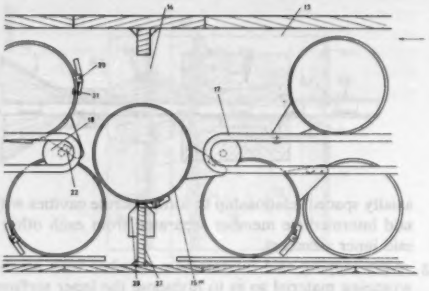
means for rotating said gun about said horizontal elevation axis to a loading position in which said lower portions of said plurality of side-by-side compartments are oriented for simultaneously receiving said plurality of ammunition rounds direct from said plurality of side-by-side hoist means.

4,064,787

MAGAZINE FOR A MOBILE FIREARM

John Folke Eklund, and Sven-Hakan Svensson, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Sept. 10, 1976, Ser. No. 722,256
Claims priority, application Sweden, Sept. 12, 1975, 7510204
Int. Cl.[2] F41H 7/06
U.S. Cl. 89—34 7 Claims



1. A magazine for delivering rounds to a feed-out position, comprising:

at least one endless chain having upper and lower courses, said chain being mounted for rotation with said upper course moving toward said feed-out position;

a plurality of tubular containers mounted on said at least one endless chain for movement therewith, each container being pivotably mounted by means of a respective fastening lug which extends laterally of the container in the direction of movement of said at least one endless chain and is pivotably attached to said at least one endless chain;

a stop located at said feed-out position and adapted to contact and support each sucessive one of said plurality of containers as each container pivots on its fastening lug away from said at least one endless chain and drops into said feed-out position; and

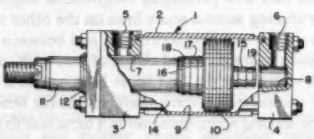
at least one blocking member mounted on each of said plurality of containers for preventing movement of rounds in said containers until said feed-out station is reached, each blocking member being positioned on its container for contact with and release by said stop when said container drops into said feed-out position.

4,064,788

CUSHIONING MEANS FOR HYDRAULIC CYLINDER

Beldon Lee Rich, Northbrook, Ill., and Zdenek J. Lansky, Solon, Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed July 29, 1976, Ser. No. 709,762
Int. Cl.[2] F15B 15/22
U.S. Cl. 91—395 3 Claims



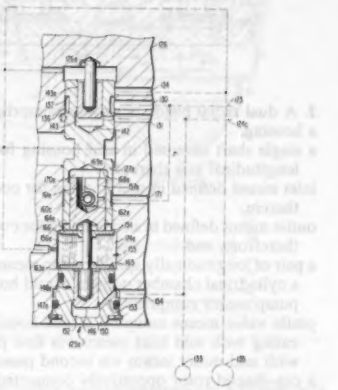
1. Cushioning means for cushioning the terminal portion of the stroke of a piston in a hydraulic cylinder wherein said cylinder has a bore in one end through which fluid is displaced from said cylinder during movement of the piston therein; said cushioning means comprising a member on said piston extending axially therefrom to enter said bore to throttle the flow of fluid through said bore during the terminal portion of said stroke; said member having first and second coaxial steps which define with said bore successive first and second annular orifices of stepwise progressively decreasing cross-section area as said piston moves in the terminal portion of said stroke; said steps being tapered to smaller diameter toward said piston to provide a sudden radial enlargement as said second step enters said bore and to provide for gradual radial contraction as said first and second steps enter said bore.

4,064,789

CONTROL VALVE FOR PRESSURE-MEDIUM SERVO-MOTOR

Jaromir Bordovsky, Leutenbach, and Klaus Katz, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Feb. 6, 1975, Ser. No. 547,569
Claims priority, application Germany, Feb. 6, 1974, 2405561
Int. Cl.[2] F15B 15/17, 13/14
U.S. Cl. 91—417 R 47 Claims



1. A control valve for a pressure medium operated servomotor of a servo-steering mechanism of the type having working pressure chamber means at respective oppositely directed working surfaces of relatively movable piston-cylinder means; said control valve comprising:

valve housing means,

valve adjusting means movably disposed in said valve housing means for controlling fluid pressure supply to said working pressure chamber means, said valve adjusting means being disposed to be acted upon by load dependent reaction pressure of said working chamber means in a direction opposite the direction of movement of said valve adjusting means from a neutral position,

double action reaction piston means, said reaction piston means having two oppositely acting reaction relief pressure surface means,

prestressed reaction spring means supporting said reaction piston means in both respective opposite axial directions with respect to said valve housing means,

and reaction piston connecting means connecting said reaction piston means with limited movement with said valve adjusting means while enabling a limited free relative adjusting path between said valve adjusting means and said reaction piston means, wherein said reaction relief pressure surface means is acted on by said reaction pressure forcing said reaction piston means in a direction reducing the effect of said reaction pressure on said valve adjusting means, whereby increase of said reaction pressure above a predetermined value results in movement of said reaction piston means against said reaction spring means to engage said connecting means and apply forces

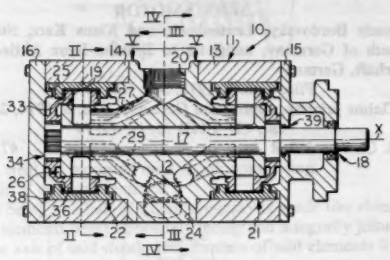
to said valve adjusting means in the direction of movement of said valve adjusting means.

4,064,790

DUAL RADIAL PISTON PUMP OR MOTOR

Willard Q. Haak, Peoria, and Guy C. Carlson, Jr., both of East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 14, 1975, Ser. No. 621,929
Int. Cl.² F01B *13/04*
U.S. Cl. 91—492 **10 Claims**



1. A dual radial piston apparatus comprising
a housing,
a single shaft mounted in said housing for rotation about a longitudinal axis thereof,
inlet means defined in said housing for communicating fluid therein,
outlet means defined in said housing for communicating fluid therefrom, and
a pair of longitudinally spaced pump means each mounted in a cylindrical chamber defined in said housing, each of said pump means comprising
pintle valve means mounted in said housing and communicating with said inlet means via first passage means and with said outlet means via second passage means,
a cup-shaped rotor operatively connected to said shaft at a spline connection for rotation therewith, whereby the rotor of each of said pump means is connected to said single shaft, and rotatably mounted on said pintle valve means in eccentric relationship relative to said chamber for communicating fluid from said first passage means to said second passage means upon rotation of said rotor,
a plurality of circumferentially spaced and hollow piston means secured on said rotor to extend radially outwardly therefrom and
a cylinder means reciprocally mounted on the end of each of said piston means and disposed in sliding bearing contact internally of said chamber for pumping fluid through said second passage means and to said outlet means upon rotation of said rotor.

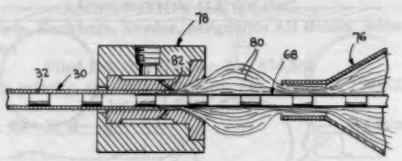
4,064,791

METHOD AND APPARATUS FOR MAKING TOBACCO SMOKE FILTER

Richard M. Berger, Richmond, Va., assignor to American Filtrona Corporation, Richmond, Va.

Division of Ser. No. 629,680, Nov. 6, 1975, Pat. No. 4,026,306.
This application Aug. 13, 1976, Ser. No. 714,237
Int. Cl.² A24C *5/50*
U.S. Cl. 93—1 C **19 Claims**

1. A method of making smoke filters comprising the steps of:
a. providing a multiplicity of discrete inner plug members;
b. continuously feeding said inner members along a path of travel;
c. providing a filtering material including a multiplicity of fibrous elements;
d. defining a bonding zone in the form of an annular space in said path of travel of said inner members;
e. continuously passing said filtering material into and through said annular space in said bonding zone and, intermediate the passage of said filtering material through said bonding zone, contacting same with a bond activating agent to bond said fibrous members of said filtering material to each other at spaced contact points thereby forming an elongated, smoke-permeable, annular intermediate member having a continuous axial bore therein and defining an annular tortuous path for passage of smoke;
f. continuously feeding said inner members into said bore in



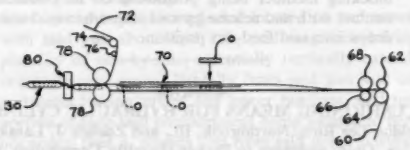
axially spaced relationship to form discrete cavities within said intermediate member separated from each other by said inner members;
g. overwrapping said intermediate member with an overwrapping material so as to juxtapose the inner surface of said overwrapping material with the exterior surface of said intermediate member to form sealed areas precluding passage of smoke thereacross; and
h. transversely severing the resulting product at selected locations to form individual filter elements.

4,064,792

APPARATUS FOR PRODUCING A PACKAGE

Larry C. Gess, 1481 Longfellow, Temperance, Mich. 48182

Division of Ser. No. 577,354, May 14, 1975, Pat. No. 4,030,662.
This application Apr. 15, 1976, Ser. No. 677,326
Int. Cl.² B31B *19/00*
U.S. Cl. 93—18 **6 Claims**



1. Apparatus for producing containers for holding objects, said apparatus comprising means for supporting a supply of a first web of material, means for producing first score lines on one surface of said web parallel to longitudinal edges thereof, means for producing second score lines on the other surface of said web parallel to said first score lines and between said first score lines and the longitudinal edges of said web, means for bending said web along the first score lines and in a direction to move the one surface toward itself, means for bending said web along the second score lines and in a direction to move the other surface toward itself, means supporting a second supply of a second web of material, means for bringing the second web into contact with portions of said first web between the longitudinal edges thereof and said second score lines, and means for pressing spaced transverse portions of said first and second web together, for bending and pressing together adjacent portions of said first web between said first and said second score lines, and for substantially simultaneously severing the pressed transverse portions along central transverse lines.

4,064,793

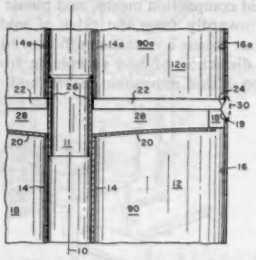
EXPANDABLE DOUBLE WALLED SMOKE STACK

Ira Michael Bennett, 307 Flora Ave., Stanhope, N.J. 07874

Continuation-in-part of Ser. No. 633,012, Nov. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 607,765, Aug. 25, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,337

Int. Cl.[2] E04F *17/02*

U.S. Cl. 98—58 10 Claims



1. A double walled expandable smoke stack section comprising inner and outer shells, a flange plate extending between said shells at the bottom thereof, a closure plate secured to said inner shell at the bottom thereof and extending downwardly from said flange plate, and a movable member means rigidly secured at its ends between the tops of said shells for enclosing the space between said shells and for preventing particles from entering said space.

4,064,794

APPARATUS FOR SKINNING OR PEELING PRODUCE SUCH AS FRUITS AND VEGETABLES

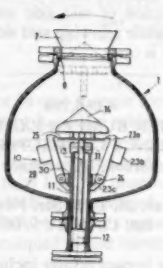
Paul Kunz, 5419) Doettesfeld, Germany

Division of Ser. No. 469,613, May 13, 1974, Pat. No. 3,959,506. This application Mar. 12, 1975, Ser. No. 557,633

Claims priority, application Germany, Dec. 6, 1973, 2360886; May 18, 1973, 2325293

Int. Cl.[2] F16J *13/02*

U.S. Cl. 99—474 18 Claims



1. A rotatably supported pressure vessel comprising an opening, sealing cover means for closing said opening, said sealing cover means including pawl catch means, opening and closing means located at least partly inside said pressure vessel, said opening and closing means including piston cylinder means arranged for operating said sealing cover means, means mounting said sealing cover means to said piston cylinder means so that the sealing means are movable under the force of gravity towards and away from said opening, said opening and closing means further comprising latching pawl means and pivot means pivotally mounting said latching pawl means within said pressure vessel, said latching pawl means being so weighted that upon rotational movement of said pressure vessel said latching pawl means is movable in response to gravity about said pivot means into a first position engaging said pawl catch means and into a second position disengaging said pawl catch means, said pressure vessel being adapted to assume a first angular position in which said latching pawl means is moving from its disengaged to its engaged position and said cover is maintained in its open position by its own weight and a second angular position in which said latching pawl means is moving from its engaged to its disengaged position and said cover is again maintained in its open position by its own weight.

4,064,795

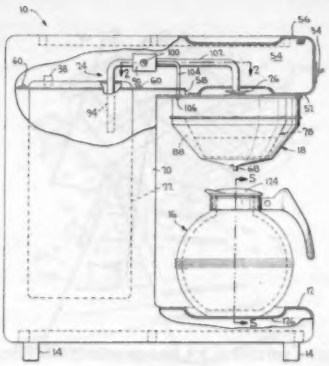
AUTOMATIC BYPASS COFFEE BREWER

Maria Elena Perdomo Ackerman, Rte. 3, Box 373D, Kinston, N.C. 28501

Filed June 1, 1976, Ser. No. 691,442

Int. Cl.[2] A41J *31/00*

U.S. Cl. 99—304 9 Claims



1. An automatic coffee brewer comprising: a water tank, means for heating water in said tank, a holder for coffee grounds, a beaker for brewed coffee positioned under said grounds holder, and means for dispensing a predetermined amount of hot water from said tank to said grounds holder, said means including bypass means for conducting a portion of said predetermined amount of hot water directly to said beaker so as to bypass grounds in said holder.

4,064,796

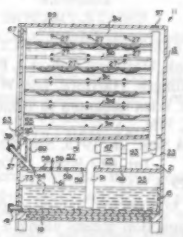
COOKING APPARATUS

John R. Jones, 4793 Coventry Mall, Memphis, Tenn. 38118

Filed Aug. 2, 1976, Ser. No. 710,917

Int. Cl.[2] A47J *37/00*

U.S. Cl. 99—330 8 Claims



1. An apparatus for cooking various food items, said apparatus comprising a housing, a reservoir for containing a quantity of cooking oil, rack means for suspending the items of food

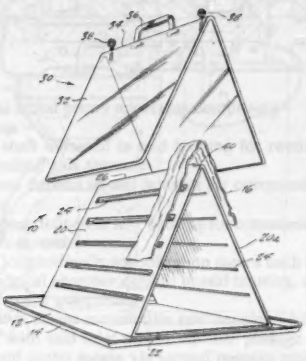
within said housing at a spaced distance one from the other, means for heating the cooking oil, vaporescence means communicated with said reservoir for forming a mist of the hot cooking oil within said housing with the suspended items of food being suffused by the mist of hot oil whereby the cooking process of the food is accomplished, forced air circulation means communicated with said housing for circulating air therethrough, said forced air circulation means and said vaporescence means being selectively and alternatively operable, and means for directing the circulating air in proximity to said reservoir of hot oil whereby the circulating air is first warmed by the hot oil.

4,064,797

BACON COOKING DEVICE

Al Forlani, 811 Hibiscus Lane, Vero Beach, Fla. 32960

Filed Apr. 2, 1976, Ser. No. 673,282
Int. Cl.[2] A47J *37/00*
U.S. Cl. 99—341 **6 Claims**



1. An oven proof bacon-strip cooking air for use in connection with the cooking of bacon in the chamber of an oven, comprising a tray portion having upwardly inclined side walls, said tray portion adapted to receive and retain cooking grease from said bacon, a bacon support member including two inclined side walls converging at an apex for receipt of said bacon thereon, said side walls defining a plurality of elongated apertures adapted to channel said grease off of said side walls and into said tray portion, a cover portion comprised of two inclined walls converging at an apex, said cover portion having an internal area greater than said bacon support member whereby said cover portion fits thereover and cooperates therewith, handle means disposed on said apex of said cover, spacing means on said cover apex adapted to engage the apex of said bacon support member whereby said cover portion may be adjustably spaced thereover and for pressing on said bacon.

4,064,798

RECEPTACLE FOR TRASH COMPACTORS

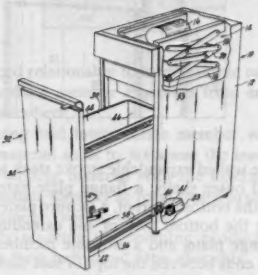
David W. Wolbrink, Hartford; Robert J. Budyak, Greendale; Du Wayne M. Sellinger, Hartford, and William A. Kaepernick, Horicon, all of Wis., assignors to Broan Manufacturing Co., Inc., Hartford, Wis.

Filed Sept. 26, 1975, Ser. No. 617,090
Int. Cl.[2] B30B *15/06*
U.S. Cl. 100—229 A **13 Claims**

1. In a trash compactor having a positioning means for mounting a compaction means along a compaction axis, the improvement comprising:

a support deck having generally parallel movement means mounted on either side thereof engagable in said positioning means for moving said support deck with respect to said positioning means in a direction generally perpendicular to said compaction axis;

a generally rectangular receptacle for containing the trash to be compacted, said receptacle including a wall means having a pair of planar side walls and a rear end wall formed of flexible sheet material, said wall means being affixed to a surface of said support deck intermediate said movement means so that said surface of said support deck forms a bottom for said wall means, said receptacle being positionable along said compaction axis and sized to receive said compaction means, said planar side walls being spaced inwardly from the sides of said deck and said movement means a distance sufficient to prevent deflection or distortion of said receptacle from affecting the operation of said movement means; and



a front panel hingedly retained on at least one of said support deck and wall means for movement between a closed position in which said front panel abuts the forward portions of said side walls to form a front end wall of said receptacle and an open position permitting removal of the compacted trash from said wall means, said front panel being mateable with said positioning means and forming, with said support deck, a drawer for the trash compactor, said front panel having flange means for embracing the forward portions of said side walls when said front panel is in the closed position along substantially the entire dimension in abutment with said front panel, said flange means being formed to permit the hinged movement of said front panel with respect to said side walls and to brace the forward portion of said side walls when said front panel is closed while allowing said side walls to flex when said front panel is open.

4,064,799

PRINT HAMMER BUMPER EXHIBITING DUAL RESILIENCY CHARACTERISTICS

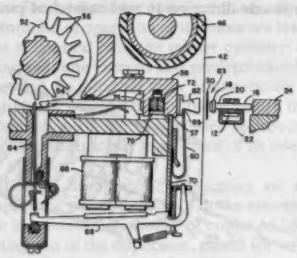
Egon S. Babler, Northbrook, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Nov. 26, 1976, Ser. No. 745,013
Int. Cl.[2] B41V *9/00*
U.S. Cl. 101—93.02 **9 Claims**

1. In an on-the-fly impact printer including a print hammer mechanism having a plurality of selectively actuable print hammers disposed in a lateral array with each hammer movable along a linear path for printing on a web composed of at least a single sheet of paper; the hammers exhibiting a forward movement directed toward the paper web during printing and a rebound movement produced by the abrupt termination of the forward hammer movement upon completion of a printing operation, an improved bumper mechanism for automatically adjusting the forward force of the hammer to the number of paper plys of the web and for damping the rebound energy of the hammer upon its return stroke comprising:

a unitary elongated resilient bumper positioned to engage each of said print hammers during their printing stroke and for engaging said print hammers upon the return stroke;

said unitary bumper defining a first portion fabricated of a first material for engaging each of the hammers during their printing stroke and exhibiting a hardness characteristic selected to reduce the forward impact force of each of the hammers upon the paper to that force necessary to produce an acceptable print upon each of the sheets in the web and having a first resiliency, and



said unitary bumper defining a second portion fabricated of a second material for engaging each of said hammers during their return stroke and exhibiting a second resiliency lower than said first resiliency so as to quickly absorb the return forces of each hammer thereby greatly reducing the intensity and duration of the hammer rebound upon return to its nonprint condition.

4,064,800

PRINTER DEVICE USING TIME SHARED HAMMERS

Sebastian W. Paccione, Norristown, and Theodore J. Risnychok, Blue Bell, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,799

Int. Cl.[2] B41J *1/20*

U.S. Cl. 101—93.14 **1 Claim**

1. A printer device having a single moving character band and a plurality of print hammers which are separated from each other across a line of print by a distance wherein each respective hammer is time shared with a plurality of print locations along said print line, the improvement comprising:

a. a barrel cam which is continuously rotated in a single direction on a shaft by a motor means;

b. follower means coupled to said barrel cam and the respective hammers;

c. a cam rotation of 180 degrees causing said follower means and each said print hammer to be linearly translated over said plurality of print locations for time sharing each respective hammer to record a line of print in a first direction;

d. the cam rotation of an additional 180° causing said follower means and each said hammer to be linearly translated in a reverse direction over said plurality of print locations for time sharing each respective hammer to record a line of print in a second direction;

e. each moving print hammer having a width dimension such that each time-shared hammer is in a position to print any character from said single moving band at a print location center before being translated to an adjacent print location center, and the width dimension of said moving hammers are approximately twice the separation of adjacent print location centers;

f. a disc means positioned on said shaft having a first and second group of indicia,

one group of indicia indicating the particular column position of each time-shared print hammer in said first direction and,

one group of indicia indicating the particular column position of each time-shared print hammer in said second direction.

4,064,801

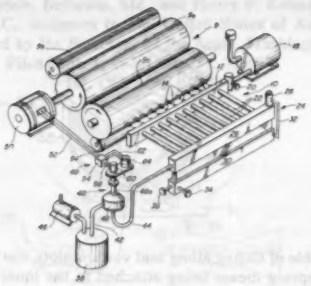
SPRAY DAMPENING SYSTEM FOR OFFSET PRINTING

Thomas G. Switall, Chicago, Ill., assignor to Ryco Graphic Manufacturing, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 604,016, Aug. 12, 1975, abandoned. This application Sept. 13, 1976, Ser. No. 722,623

Int. Cl.[2] B41F *7/24*; B41L *25/06*

U.S. Cl. 101—147 **16 Claims**



1. In a spray dampening system for delivering a dampening fluid to a rotating cylinder of a printing press; a plurality of spray nozzles; means supplying air under pressure to said nozzles to atomize and transport the dampening fluid to the printing press cylinder; fluid delivery means for delivering dampening fluid to said nozzles, said fluid delivery means including first fluid regulating means for adjustably restricting the passage of dampening fluid through said fluid delivery means to said nozzles, second fluid regulating means for adjustably regulating the pressure of the fluid delivered to said nozzles by said fluid delivery means; and regulator control means, comprising first sensing means for sensing the speed of the press, second sensing means for sensing the state of one of said fluid regulating means, and means operatively connected to said one fluid regulating means and responsive to said first and second sensing means for adjusting said one fluid regulating means in accordance with the speed of the press, whereby the flow of fluid to the nozzles may be adjustably regulated.

4,064,802

ROTARY STAMP

Takaji Funahashi, No. 2-1, Kitatakasho, Nishi, Nagoya, Aichi, Japan

Filed Oct. 26, 1976, Ser. No. 735,527

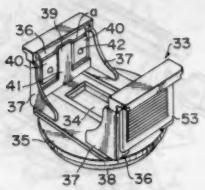
Claims priority, application Japan, Nov. 6, 1975, 50-151185[U]; May 25, 1976, 51-6696[U]

Int. Cl.[2] B41K *1/10*

U.S. Cl. 101—327 **2 Claims**

1. A rotary stamp comprising an upper frame having a substantially U-shaped form and including a top plate and a pair of facing side plates connected to both ends of the top plate, respectively, a fixed shaft supported substantially midway between said side plates, a bridge laid out between the lower ends of said side plates, a plurality of cylindrical rotary members rotatably supported on said fixed shaft in said upper frame, each rotary member having an annular disc formed integrally

with one end thereof and toothed on the circumference thereof, a plurality of endless belts, each endless belt being stretched around said bridge and the corresponding rotary member and having on the surface thereof a plurality of printing members, a lower frame including a plate having an opening at the center thereof and a pair of facing frame plates attached in an erect posture on both sides of said opening, respectively, said plate having another printing member fixed to the lower face thereof by bonding or other means and said opening having such a size that when the endless belts are located below said bridge, the printing members of said endless belts are well fitted within said opening, the improvement comprising the provision in each of said side plates of the upper frame, of a pair of parallel vertical slots, each frame plate of said lower frame having a pair of inwardly facing side plates connected to both the side ends thereof, spring means attached to the inside of each frame plate of said lower frame, each of said spring means including a central plate and a pair of spring plates connected to both side ends of the central plate, each of said spring plates having, on the inner face thereof a projection to be engaged with a corresponding one of said vertical slots



and capable of sliding along said vertical slots, the central plate of each spring means being attached to the inner face of said frame plate, each spring plate being arranged so that a spacing is formed between the spring plate and the inner face of said frame plate and a spacing is also formed between the outer end of the spring plate and said inwardly facing side plates, a T-shaped arm plate connected to the lower end of said central plate, said T-shaped arm plate having a pair of arm members in the lower portion thereof, and the lower end of each arm being pressed into the plate of the lower frame and the free end of each arm being kept in contact with said inwardly facing side plate wherein by engagement of the projections on the spring means with the vertical slots on both the side plates and sliding movement of said projections along said vertical slots, said upper frame is allowed to move in the vertical direction with respect to the lower frame and when the endless belts are located below said bridge, the printing members of the endless belts are allowed to move in the vertical direction along a distance between a position at which said printing members of the endless belts are on a plane common with said other printing member on the lower face of the plate of the lower frame and a position retreated from said position.

4,064,803

PRINTING SADDLE WITH ROCKER ARM LOCKUP

David B. Czinger, Huntington Beach, Calif., assignor to Beach Manufacturing Corporation, Huntington Beach, Calif.

Filed Sept. 7, 1976, Ser. No. 721,105
Int. Cl.[2] B41F *27/14*
U.S. Cl. 101—415.1 **6 Claims**

1. Rocker arm actuated printing saddle apparatus comprising:

an elongated semicylindrical shell formed on its interior with a medial rocker arm recess leading to one end of said shell and a central link recess leading from the inner extremity of said rocker arm recess to one side of said shell;

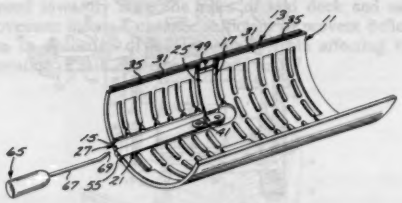
a biasing bar projecting along said one side;

biasing means biasing said bar away from said one side of said shell;

an elongated resilient rocker arm disposed in said rocker arm and terminating at its outer extremity in a latch keeper shiftable between latched and unlatched positions upon rotation of said rocker arm in opposite directions;

pivot means pivotally mounting said rocker arm medially from said shell to retain said arm against said shell to urge said latch keeper resiliently against said shell;

a link connecting the inner extremity of said rocker arm with said biasing bar to cause said biasing means to bias said arm in one direction to said unlatched position; and lock



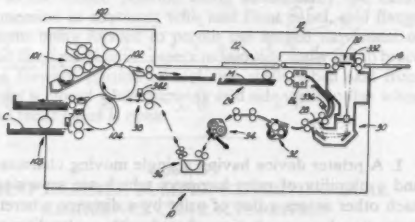
means mounted on said shell adjacent the free extremity of said rocker arm including a hook positioned to cause said rocker arm to resiliently urge said keeper into engagement therewith when said arm is in its latched position whereby said biasing bar will be normally biased to pivot said rocking arm to its unlatched position but upon rotation of said rocker arm to its latched position said latch keeper will be engaged with said hook to retain said biasing bar retracted.

4,064,804

DUPLICATOR AND METHOD OF DUPLICATING

Roy C. Schweitzer, Hoffman Estates, Ill., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed June 26, 1975, Ser. No. 590,700
Int. Cl.[2] B41M *1/06*; B41F *7/24, 31/00*
U.S. Cl. 101—451 **18 Claims**



1. The method of lithographic duplicating on a rotary lithographic duplicator which comprises applying ink from an ink fountain to a lithographic master on a master cylinder by means of an ink train including a fountain roller and an ink form roller, which includes the steps of:

sensing the temperature at the ink fountain and generating electrical signals indicative thereof; and

in response to said signals automatically controlling the speed of transfer of ink from the ink fountain roller to the ink form roller in inverse relation to the temperature level sensed.

6. A method of duplicating on a rotary lithographic duplicator having a master cylinder which comprises the steps of automatically preparing and processing lithographic masters and forwarding them in sequence to the master cylinder, applying moisture from a moisture fountain to each lithographic master on the master cylinder by means of a moisture train, and which includes the step of automatically interrupting the operation of the moisture train to prevent the forwarding of mois-

ture when a used master leaves the master cylinder, and the step of automatically restoring operation of the moisture train whenever a new master approaches the master cylinder, which method includes the steps of:

automatically measuring the time between the departure of one master from the master cylinder and the preparation of the next master;

when the measured time is less than a predetermined normal dry-out time for the moisture train, automatically triggering the restoration of operation of the moisture train as the new master is inserted onto the master cylinder; and

when the measured time exceeds said predetermined normal dry-out time for the moisture train, automatically triggering the restoration of operation of the moisture train during the preparation of the new master approaching the master cylinder substantially in advance of its insertion on the master cylinder.

18. The method of lithographic duplicating on a rotary lithographic duplicator which includes a down-counting copy counter settable to control the number of copies to be printed in the next printing run of the duplicator, means for selectively activating the ink and moisture trains for either of two determinate pre-inking periods of different durations each of fixed extent, one of said determinate pre-inking periods corresponding to one range of copy count settings of the down-counting copy counter and the other determinate pre-inking period corresponding to another range of copy count settings of the down-counting copy counter, which method comprises applying ink and moisture to the surface of a lithographic master by means of ink and moisture trains and which includes the step of pre-treating each new master with ink and moisture for a pre-inking period before starting to print, and which method further includes the steps of:

setting a desired number of copies into the down-counting copy counter; and

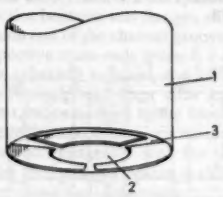
automatically controlling the selectively activating means in response to the copy count setting of the down-counting copy counter in a manner to select the determinate pre-inking period corresponding to that range of copy count settings which embraces the existing copy count setting.

4,064,805

DEVICE FOR PYROTECHNICAL ILLUMINATING CHARGE

Stig Erland Dahlberg, Bjorneborg, and Nils Goran Axel Gellerstedt, Karlskoga, both of Sweden, assignors to AB Bofors, Bofors, Sweden

Filed May 19, 1976, Ser. No. 687,804
Claims priority, application Sweden, May 23, 1975, 7505877
Int. Cl.[2] F42B *25/04, 13/38*
U.S. Cl. 102—35 **20 Claims**



1. An improved pyrotechnical illuminating apparatus of the type adapted for use in parachute flares, comprising:

an essentially cylindrical container for an illuminating charge, said container having an open end from which light-emitting flame gases and other products of combustion issue in use;

flame distributing disc means arranged across said open end for spreading said flame gases radially outwardly as they issue from said container to create a turbulent admixture of air and the gases and other products issuing from said container during combustion; and

an illuminating charge located within said container which comprises a metallic reducing agent, an oxidizing agent and a bonding agent, the quantity ratio of the reducing agent to the oxidizing agent being substantially greater than the ratio for such a charge would be for efficient combustion in an apparatus having no such flame distributing disc means arranged to spread flame gases and other products of combustion,

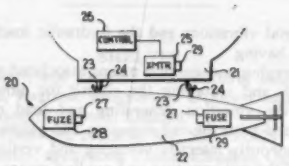
whereby a substantial excess of reducing agent is carried unburned from said container with the flame gases generated upon combustion of said charge; is spread out by said flame distributing disc means; and is mixed turbulently with the surrounding air in the outer portions of the flame gases, the quantity of said substantial excess being sufficient to produce high intensity light emitting flames.

4,064,806

ULTRASONIC REMOTE CONTROL SYSTEM

Maurice Apstein, Bethesda, Md., and Henry P. Kalmus, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 1, 1976, Ser. No. 719,861
Int. Cl.[2] F42C *17/00*
U.S. Cl. 102—70.2 R **9 Claims**



1. The method of transmitting information from a first location in a structure to one or more remote locations in said structure, said method comprising the steps of:

generating an alternating ultrasonic electrical signal representing said information;

frequency-modulating said electrical signal;

at said first location, transducing said electrical signal to surface wave vibrations in said structure, said surface waves being spatially shifted at the modulation frequency;

at said one or more remote locations, transducing said surface wave vibrations back into an electrical signal.

4,064,807

MOBILE APPARATUS FOR NON-STOP TRACK LEVELING AND BALLAST TAMPING

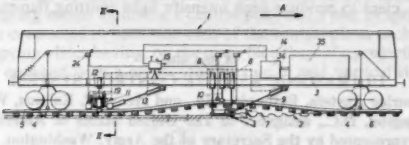
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H., Vienna, Austria

Filed May 26, 1976, Ser. No. 689,993
Claims priority, application Austria, Aug. 18, 1975, 6395/75
Int. Cl.[2] E01B *29/04*
U.S. Cl. 104—7 A **9 Claims**

1. In a mobile apparatus for continuously leveling a track and compacting ballast of a ballast bed supporting the track consisting of two rails fastened to ties resting on the ballast, which comprises a frame mounted on the track for continuous advancement therealong during the leveling and ballast compaction, a reference system controlling the track leveling, a roller unit mounted on the frame for lifting a section of the track, plow means mounted on the frame for moving ballast onto the ballast bed below the lifted track section and for leveling the said ballast, and a ballast compacting means mounted rearwardly of the plow means in the direction of advancement, the ballast compacting means comprising means for imparting vibrations to the track and hydraulic load means

associated therewith for simultaneously exerting pressure to both rails of the track section in the direction of the leveled ballast bed whereupon the track section rests, the combination of

1. the plow means comprising plow elements for moving the ballast so that there are formed two elongated raised ballast strips below the track rails for support of the ties in the region of the rails and an elongated intermediate strips between the two raised ballast strips, the intermediate strip being recessed, and
2. the ballast compacting means comprising a chassis supporting a means for generating at least approximately



horizontal vibrations and the hydraulic load means, the chassis having

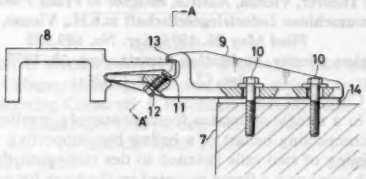
a. rail engaging and guiding means associated with each of the rails and mounting the chassis for mobility on the track, the vibration generating and load means being associated with the rail engaging and guiding means for simultaneously laterally vibrating and vertically loading each of the rail engaging and guiding means, and
b. pressure fluid operated means for continuously laterally pressing the rail engaging and guiding means without play with respect to the chassis and against the rail with which it is associated.

4,064,808

ARMATURE RAILS AND RAIL CARRYING ARRANGEMENT FOR ATTRACTION TYPE MAGNETICALLY FLOATED TRAVELLING BODY

Shinji Nakamura, Kawasaki, and Kiyoshi Mihirogi, Odawara, both of Japan, assignors to Japan Air Lines Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1977, Ser. No. 785,296
Claims priority, application Japan, Mar. 8, 1977, 52-25285
Int. Cl.[2] B61B *13/08*
U.S. Cl. 104—148 MS **6 Claims**



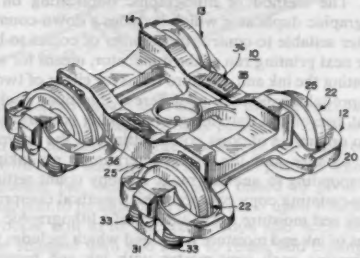
1. A structural arrangement for carrying armature rails of an attraction type magnetically floated travelling body comprising a plurality of carrying blocks which are fixed to bases and are arranged with spacing in the longitudinal direction of said rails; and an armature rail which is carried along the side of the bases by the carrying blocks, said armature rail being provided with a groove and a flange formed on one side thereof confronting the carrying block, each carrying block being provided with a groove which engages with the tip of the flange of the armature rail and with an extruding arm which engages with the groove provided in the armature rail, the structural arrangement further including a tightening means for connecting each armature rail to each carrying block by tightening the engagement of the flange of the rail with the block and the engagement of the extruding arm of the block with the groove of the rail respectively.

4,064,809

ARTICULATED RAILWAY CAR TRUCK

Harry William Mulcahy, Griffith, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jan. 12, 1976, Ser. No. 648,112
Int. Cl.[2] B61F *3/08, 3/16, 5/30, 5/40*
U.S. Cl. 105—167 **5 Claims**



1. A four wheel truck for a railway freight car and the like comprising

a pair of longitudinally spaced apart axle bolsters;

independently rotatable wheels mounted at opposite ends of each axle bolster;

a span bolster connecting each of said axle bolsters; and

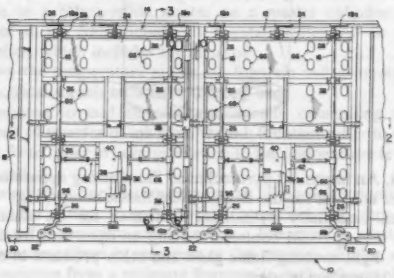
mounting means mounting said axle bolsters for independent movement relative to each other and to said span bolster for yawing movement about respective vertical axes located approximately on the respective axis of rotation of said wheels at each end of said axle bolster and substantially midway of said wheels at each end of said axle bolster.

4,064,810

RAILWAY CAR DOOR ACTUATING APPARATUS

Oliver James Jenkins; Walter Samuel Ryan, both of Youngstown, and Leslie David Suit, Girard, all of Ohio, assignors to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Oct. 24, 1975, Ser. No. 625,490
Int. Cl.[2] B61D *17/08, 17/18, 19/00*; E05D *15/10*
U.S. Cl. 105—378 **7 Claims**



1. In a railway car door of the type including a pair of pipes and cranks rotatably secured to the door, an operating mecha-

nism for rotating said pipes and cranks including a shaft rotatably supported on said door, activating means secured on said shaft and transmission means supported on said door inter-connecting said operating mechanism with said pipes and cranks whereby rotation of said shaft in response to operation of said activating means imparts corresponding rotation to said pipes and cranks and selective lateral movement of said door into and out of an opening in the side of said railway car, said car being equipped to have internally projecting lading restraining members selectively attached and removed from the inside of the railway car side wall adjacent said opening, and filler members removably attached to the inside of said door, said filler members project into said car by an amount substantially equal to the internal projection of said lading restraining members, the improvement comprising:

means for selectively increasing and decreasing the amount of rotation of said pipes and cranks possible such that when said filler members are attached to the inside of said door, said pipes and cranks can move a greater rotational distance to move said door laterally out of said opening a first, greater distance to permit said filler members to clear said side wall; and, when said filler members are removed, said cranks and pipes are permitted to rotationally move a lesser distance which is sufficient for said door without said filler members attached thereto to move a second, lesser distance laterally out of said opening and to clear said side wall.

4,064,811

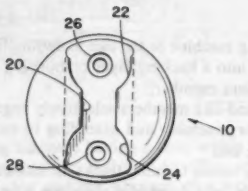
QUICK DISCONNECT ANCHOR

Donald R. Copeland, 11718 E. 1st St., Tulsa, Okla. 74128

Filed Dec. 22, 1975, Ser. No. 642,918

Int. Cl.[2] A44B *19/00*; B25B *25/00*; B60P *7/06*; B61D *45/00*

U.S. Cl. 105—476 **9 Claims**



1. Quick disconnect device for attachment of objects to a fixed surface relative thereto comprising a spherical segment shoe member having a flat base surface securable to the fixed surface, a channel groove transversely extending completely through the segment parallel to the base surface and having the opposite ends open, inwardly extending flange members making up a portion the outer surface of the spherical segment and forming a narrow slot between said flanges, enlarged openings in the flanges at each end of the channel groove in communication with the respective open ends thereof; a coupling means attachable to the spherical segment and comprising a foot member slidable through said open ends into the channel groove, attachment means secured to the foot member for the attachment of movable objects, retainer means carried by the attachment means and engageable with the shoe member to selectively lock the foot member within the channel groove.

4,064,812

FOLDABLE PICNIC TABLE

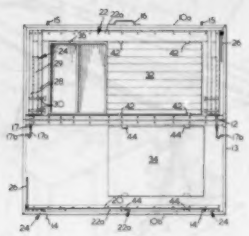
Ephrem Commanda, P.O. Box 1244, Espanola, Ontario, Canada

Filed June 15, 1976, Ser. No. 696,414

Int. Cl.[2] A47B *3/00, 35/00*; F24C *15/10*

U.S. Cl. 108—36 **5 Claims**

1. A foldable picnic table comprising two similar table top portions hinged together along a first hinge axis for movement from a co-planar relationship providing a normal table top, to a folded relationship in which the undersides of said portions lie substantially parallel and spaced apart to provide a storage space therebetween, said portions each having two legs with a connecting member extending between and rigidly fixed to said legs, said connecting member and legs being hingedly connected to the respective table top portion by hinge means



extending parallel to said first hinge axis, said legs and member being foldable against the underside of the respective table top portion and being capable of fitting between said table top portions when folded, and wherein said connecting member includes retaining means moveable therewith to hold a removable picnic device firmly against the underside of one of said table top portions when the table is folded.

4,064,813

SHELVES

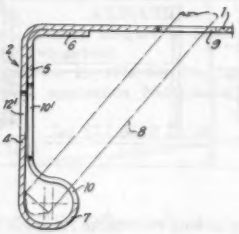
Alan R. Hewett, and Leonard T. Robilliard, both of Hemel Hempstead, England, assignors to Dexion-Comino International Limited, Middlesex, England

Filed Oct. 20, 1976, Ser. No. 733,988

Claims priority, application United Kingdom, Oct. 22, 1975, 43392/75

Int. Cl.[2] A47B *57/00*

U.S. Cl. 108—60 **16 Claims**



1. A shelving apparatus comprising:

a shelf panel,

an edge flange formed integrally with said shelf panel,

said flange comprising a first portion depending from said panel and a second portion which lies against the inside of the first portion and extends to and beyond the line of junction of said first portion with said shelf panel,

said second portion lying also against a marginal portion only of the underside of said panel.

4,064,814

SELF-LEVELING EXTENDABLE TABLE

Joseph E. Pokorny, 500 Saylor Way, Las Vegas, Nev. 89107, and Richard N. Keller, 2818 E. Tonopah, North Las Vegas, Nev. 89030

Filed Mar. 7, 1977, Ser. No. 774,676

Int. Cl.[2] A47B *13/06*

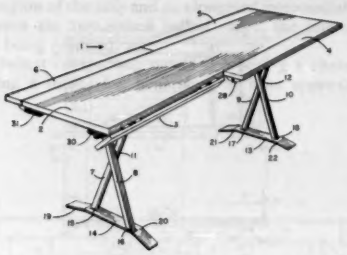
U.S. Cl. 108—64 **8 Claims**

1. A table which tends to be stable and to maintain the top in

a horizontal plane when set on a slightly irregular surface comprising a rectangular horizontal flat top affixed to a base, the base comprising:

a horizontal rectangular angle iron support frame,

a plurality of pairs, disposed lengthwise, of tubular crossed legs, the legs of each pair being fixably mounted to and



depending downward from opposing lengthwise sections of the angle iron support frame, and being immovably attached to each other at the point of crossing,

each pair of legs affixed to a foot comprising a substantially flat member situated widthwise to the table, said flat member being slightly arched so as to contact a supporting floor surface only at the ends of the flat member.

4,064,815

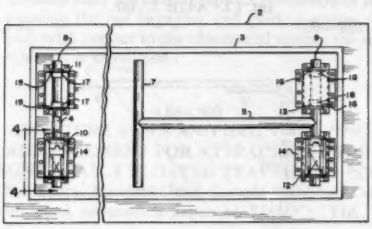
TABLE LEG LOCKING MECHANISM

Elliott W. Baum, St. Louis, Mo., assignor to Berco Industries, St. Louis, Mo.

Filed July 19, 1976, Ser. No. 706,737

Int. Cl.[2] A47B *3/08*

U.S. Cl. 108—129 **5 Claims**



1. A table leg locking mechanism for use in fixing a leg with respect to the table means it supports comprising, a cross bar rigidly secured to the table leg, at least one pivot mount secured to said table means and having the cross bar pivotally disposed therethrough, each pivot mount comprising a pair of box shaped housings secured to the underside of the table means, each housing having a pair of aligned apertures provided therethrough, a bushing means being retained proximate each aperture of the housing, said cross bar being bearingly disposed within each bushing means through the housing apertures with said table leg between said housing, retaining means provided within at least one of said housings and provided for fixing its associated table leg into a predetermined position, said retaining means comprising a pair of sleeves, each of said sleeves having the cross bar disposed therethrough, the first sleeve being rigidly secured to one of said housings and proximate the bushing means, the second sleeve being rigidly secured to the cross bar, engaging means cooperating between the said sleeves and capable of fixing the table leg into a supportive position, said engaging means including a wedging member projecting from one of said sleeves, the mating groove being accommodating of the wedging member for engagement of the said sleeves and fixing of the table leg into its supportive position, a spring surrounding said cross bar and operatively associated with the said sleeves, and said spring normally biasing the wedging member of one sleeve into the groove of the other sleeve and thereby fixing the said leg into its operative supportive position.

4,064,816

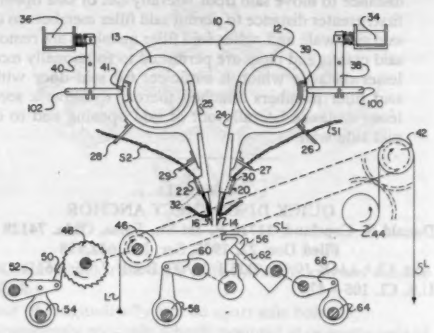
DOUBLE SELECT NEEDLE TUFTING MACHINE

Abram N. Spanel, Princeton, N.J.; P. Frank Eiland, Stamford, and David R. Jacobs, New Canaan, both of Conn., assignors to Abram N. Spanel, Princeton, N.J.

Filed June 25, 1976, Ser. No. 700,413

Int. Cl.[2] D05C *15/16*

U.S. Cl. 112—79 A **7 Claims**



1. A tufting machine or the like including tufting needles for tufting yarn into a backing layer comprising:

an oscillatory member;

flexible band-like members selectively engageable with said oscillatory member and extending to each of said tufting needles; and

restraining means forming tracks for said band-like members to enable said band-like members to effectively impart motion without unwanted flexing to said needles.

4,064,817

PATTERN INDICATOR MECHANISM FOR A SEWING MACHINE

Toshio Sawada; Kimihiko Yamamoto, and Hitoshi Ishikawa, all of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 28, 1976, Ser. No. 736,412

Claims priority, application Japan, Nov. 14, 1975, 50-155665[U]

Int. Cl.[2] D05B *3/02*

U.S. Cl. 112—158 F **6 Claims**

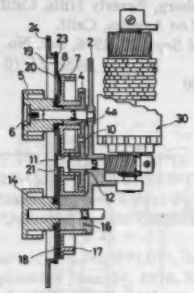
1. A stitch pattern indicator mechanism for a sewing machine having a pattern selector cam mechanism comprising:

a pattern selector knob rotatably mounted on said machine;

a cam actuating means operatively connected to said pattern selector knob for actuating said pattern selector cam mechanism upon rotation of said pattern selector knob;

a pattern indicator plate having a plurality of pattern symbols illustrated thereon and which is operatively connected to said cam actuating means for indicating a pattern selected by said pattern selector knob; and

a feed length indicator plate operatively connected to said cam actuating means for automatically indicating a feed



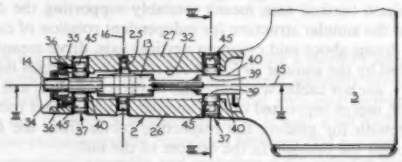
length corresponding to the pattern selected by said pattern selector knob.

4,064,818

SEWING MACHINE BASE

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Aug. 20, 1976, Ser. No. 716,133
Claims priority, application Italy, Sept. 11, 1975, 27123/75
Int. Cl.[2] D05B *73/06*
U.S. Cl. 112—258 **1 Claim**



1. In a sewing machine having a base within which at least one feed dog support bar is driven to effect actuation of the machine's feed dog and the advance of a workpiece to the stitch forming instrumentalities, said base comprising:

a. an elongated unitary body member (2) of substantially tubular configuration;

b. guide means (37) assembled in said body member (2) for locating the feed dog support bar in a position parallel with the axis of said body member (2) which includes:

i. a pair of cylindrical elements (38) selectively fixed in aligned seats (41) formed in the opposed side walls of said body member (2); and

ii. an annular seat (42) formed in each of said cylindrical elements (38) with sealing rings (43) assembled therein having a configuration conforming to said seats (41).

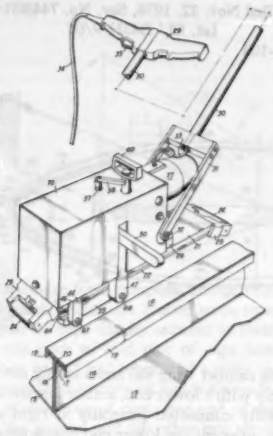
4,064,819

MACHINE FOR PROGRESSIVELY CLOSING FLANGES OF CAP STRIPS ON STANDING T-RIB ROOFS

John F. Fox, Riverdale, Ga., assignor to Atlanta Metal Products, Inc., Atlanta, Ga.

Filed Mar. 3, 1977, Ser. No. 774,104
Int. Cl.[2] B21D *37/00*
U.S. Cl. 113—55 **10 Claims**

1. A machine for progressively closing cap strip side flanges on a standing T-rib comprising a base plate, means on the base plate to guide the machine longitudinally of a standing T-rib, power means on the base plate including a rotary eccentric element, a follower engaging the rotary eccentric element and being reciprocated thereby substantially normal to the base plate, a pair of cap strip side flange closing dies disposed below the base plate in laterally spaced relationship, forward and rear suspension arms for the dies pivoted thereto and also being pivotally mounted relative to the base plate for lateral swinging with the dies so that the dies may assume separated inclined



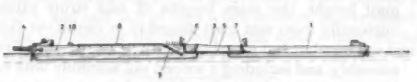
positions and side-by-side substantially vertical positions, and said forward suspension arms being coupled to said follower and reciprocated thereby to cause oscillation of the dies about their rear pivoted ends.

4,064,820

APPARATUS FOR THE MARINE TRANSSHIPMENT OF A LIQUID

Christoph Vogt, Monaco, assignor to Single Buoy Moorings Inc., Fribourg, Switzerland

Filed Nov. 29, 1976, Ser. No. 745,534
Claims priority, application Netherlands, July 30, 1976, 7608513
Int. Cl.[2] B63B *25/08*
U.S. Cl. 114—74 R **2 Claims**



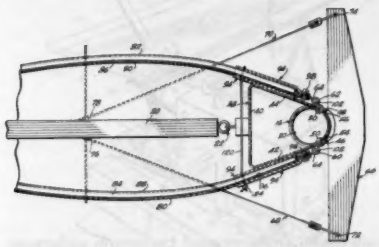
1. Apparatus for the marine transshipment of a liquid, comprising an elongated vessel, a guide track having a horizontal portion extending lengthwise of said vessel to a point near one end of the vessel, the track from said point then having a downwardly inclined portion toward said end of the vessel to at least the water level, a flexible conduit, the guide track being at least about as long as the conduit, means for pulling the conduit lengthwise along the guide track, said means for pulling the conduit along the track comprising a pair of rails on either side of the horizontal section of the track and a trolley movable along said rails, one end of said conduit being connected to said trolley, and means for moving the trolley along the rails, the rails extending beyond said horizontal portion of the track to the end of said vessel, said end of said conduit being pivotally mounted on said trolley for vertical swinging movement about a horizontal axis, so that when said trolley moves beyond said horizontal portion of the track above said inclined portion of the track, said end of said conduit will pivot relative to said trolley.

4,064,821

VARIABLE CAMBER WING SAIL

William C. Roberts, Jr., 1442 39th St., West Palm Beach, Fla. 33407, and Stephen Edmonds, 1160 Coral Way, Riviera Beach, Fla. 33404

Filed Nov. 22, 1976, Ser. No. 744,031
Int. Cl.[2] B63H 9/06
U.S. Cl. 114—103 17 Claims



1. A variable camber wing sail and a sailing device including a mast assembly with a lower end, a mast support structure and a boom pivotally connected generally at right angles to the mast assembly adjacent the lower end comprising:

means to mount the mast for rotational movement about its vertical axis to said support structure of the sailing device, said mast assembly including a main, generally vertically extending mast member and an outwardly extending projection comprising a vertically extending rigid beam along the major portion of the mast height, said beam including a trailing end portion,

a sail member positioned relative to the rotatable mast assembly and boom including a main body portion, forward and trailing edges, and a clew corner portion,

a plurality of resiliently deformable struts fixed relative to said sail member along a major portion of their lengths in a spaced apart, generally horizontal, parallel relation, each of said struts including forward and trailing end portions and extending between said forward and trailing sail edges,

means to support said sail member with said struts in a hoisted position relative to said rotatable mast assembly and boom with said sail forward edges and said struts forward end portions engaging said mast assembly and overlying said outwardly extending projection along the mast height, the main lengths of said struts extending outwardly from said mast assembly in cantilever fashion,

said sail member and plurality of struts comprising a first sail assembly, and including a second sail assembly with means to support it in a hoisted position relative to said rotatable mast assembly and boom in a spaced apart relation to said first sail assembly, said second sail assembly including a sail member having a main body portion, forward and trailing edges and a clew corner portion, and a second plurality of resiliently deformable struts, fixed to said second sail member, conforming in all respects to said plurality of said first sail assembly struts,

connection means between said clew corner portions and the boom to permit translation of said clew corner portions relative to the boom while maintaining proper tension forces in the sail between said boom and mast assembly,

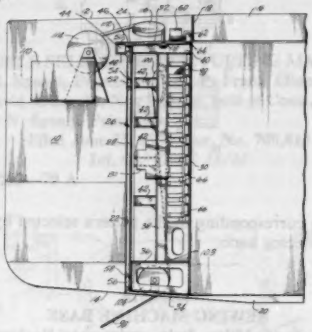
a mast assembly rotation control means, including opposed outwardly extending end portions, fixed to said mast, and block and tackle means connecting between said opposed end portions and said boom for selective rotational operation of said mast assembly in either direction to impart a cam action to the plurality of struts by said rigid beam trailing end portion to bend said struts to a degree in direct proportion to the amount of rotation of said mast assembly.

4,064,822

SELF-CONTAINED MOORING SYSTEM FOR A DRILL SHIP

Russell B. Thornburg, Beverly Hills, Calif., assignor to Global Marine, Inc., Los Angeles, Calif.

Filed Sept. 20, 1976, Ser. No. 724,274
Int. Cl.[2] B63B 21/16
U.S. Cl. 114—230 9 Claims



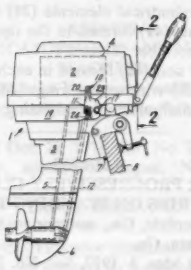
1. A mooring system for a drill ship comprising: a hull having a chamber opening to the sea through the bottom of the hull, an annular structure mounted in the chamber, means rotatably supporting the annular structure from the hull for rotation about a vertical axis, a plurality of coaxially aligned rotatable drums having their axes of revolution coaxial with a common vertical axis, means rotatably supporting the drums from the annular structure for independent rotation of each of the drums about said common vertical axis, drive means supported by the annular structure for rotating the drums individually, anchor cables wound on the respective drums, and cable guide means supported on the annular structure and rotatable therewith for guiding the respective cables from the drums through the opening in the bottom of the hull.

4,064,823

ELECTRIC STARTER INTERLOCK FOR OUTBOARD MOTOR DEVICES

James Richard Draxler, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed July 28, 1976, Ser. No. 709,448
Int. Cl.[2] B63H 5/13; F02N 17/00
U.S. Cl. 115—17 11 Claims



1. A marine propulsion device having an internal combustion engine, an outer enclosure for said engine, a shift mechanism, an electrically operated starter mechanism, a start control switch means having an external operator extending from the enclosure, said switch means controlling energization of the starter mechanism, and a shift lever movably mounted adjacent said external operator and having wall means posi-

tioned in overlying relation to said external operator in all positions other than the neutral position to thereby block access to the external operator except when the lever is in the neutral position.

4,064,824

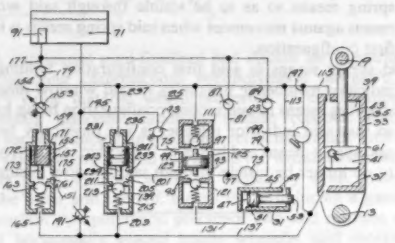
HYDRAULICALLY POWERED MARINE PROPULSION TILTING AND TRIMMING SYSTEM WITH MEMORY

Charles B. Hall, Ingleside, Ill., and Robert F. Young, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 571,077, April 24, 1975, abandoned. This application Mar. 24, 1976, Ser. No. 670,055

Int. Cl.[2] B63H *5/12*

U.S. Cl. 115—41 HT **24 Claims**



1. A marine propulsion device including a member adapted to be attached to a boat hull, a propulsion assembly pivotally connected to said member for vertical swinging movement when said member is attached to the boat hull, a tilt hydraulic cylinder-piston assembly connected between said member and said propulsion assembly and including a tilt cylinder having opposed first and second ends, a trim hydraulic cylinder-piston assembly including a trim cylinder fixed relative to one of said member and said propulsion assembly, having opposed first and second ends, and having therein a reciprocably movable trim piston having a piston rod extending through one of said ends of said trim cylinder and adapted for releasable engagement with the other of said member and said propulsion assembly, a reversible pump including first and second ports, said pump being operative, when said pump is operating in a first mode, to supply hydraulic fluid under pressure at said first port and to provide suction at said second port and being operative, when said pump is operating in a second mode, to supply hydraulic fluid under pressure at said second port and to provide suction at said first port, first conduit means communicating between said first end of said tilt cylinder and said first pump port and including a first valve biased so as to releasably prevent flow from said first end of said tilt cylinder to said first pump port and so as to permit fluid flow from said first pump port to said first end of said tilt cylinder in response to the presence of hydraulic fluid under pressure at said first pump port, second conduit means communicating between said first end of said trim cylinder and said first pump port independently of said first valve means, said second conduit means including a second valve biased so as to releasably prevent flow from said first end of said trim cylinder to said first port and so as to permit fluid flow from said first pump port to said first end of said trim cylinder in response to the presence of hydraulic fluid under pressure at said first pump port and independently of said first valve means, and third conduit means communicating between said second pump port and said second ends of said trim cylinder and said tilt cylinder.

4,064,825

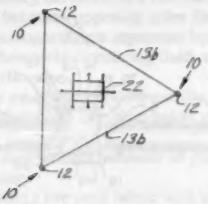
ALARM DEVICE FOR A CAMPSITE

Steve R. Sly, 828 Vanardol, Clarkston, Wash. 99403

Filed Sept. 13, 1976, Ser. No. 722,784

Int. Cl.[2] G08B *13/12*

U.S. Cl. 116—81 **1 Claim**



1. An alarm device for a campsite, comprising a plurality of spaced apart tubes, which are placed so as to encompass the campsite, a pair of caps fixedly secured at their end walls to each other, one each of said pair of caps being removably received on one end of said tubes, and a spike, pointed at each end, is fixedly secured within said end walls on the longitudinal axis of each of said pair of caps, one end of said spike being entered into the ground and the other end serving as support and firing pin means for a primer within each of said tubes, and a trip pin is slidably and removably received transversely through an opening near the upper end of said tubes, said trip pins each being secured to an end of a cord on the exterior of said tubes, the opposite end being tied to the outer periphery of the adjacent tube of the plurality of said tubes, and said trip pin abuts against and supports a gravity actuated weight in said tubes until an intruder strikes said cord of said trip pin, said trip pin being removed from the support position of said gravity actuated weight by the cord being pulled by the intruder striking said cord, and said gravity actuated weight descends downwards in said tube and, by inertia means, forcibly urges said primer against the pointed end of said spike within said tube, thus firing said primer, the gases of the explosive report of said primer being discharged through a plurality of radially spaced apart ports through the wall of said tube, which will alert the camper, and a cap is fixedly secured to the upper end of each of said tubes to prevent precipitation from entering the said tubes and said caps fixedly secured to the upper end of each of said tubes, in conjunction with said pair of caps, provides storage means for said gravity actuated weight, said trip pin, said cord and a plurality of said primers when entered into said tubes, and said pair of caps when inverted and replaced on said tube will enclose the portion of said spike within one tube, that is normally entered into the ground.

4,064,826

REFRIGERANT LIQUID INDICATOR

Jude A. Pauli, Florissant, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 3, 1976, Ser. No. 682,194

Int. Cl.[2] F25B *49/00*; G02B *7/00*

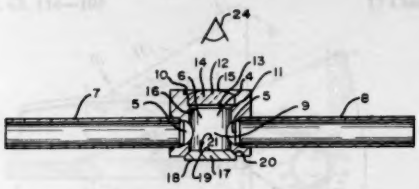
U.S. Cl. 116—117 C **4 Claims**

4. A sight glass which indicates the difference between a full fluid condition and any fluid condition less than a full condition, comprising:

a body part, said body part having a first opening and a second opening intersecting one another in said body part, the intersection of said openings defining a sight chamber;

a convex lens mounted to said body part along said first opening on a first side of the intersection of said first and said second openings, said lens closing said first opening, said convex lens having a first curved wall directed outwardly of said first opening, and a generally planar wall directed inwardly of said first opening, said convex lens magnifying any bubbles present in said sight chamber; and

closure means mounted to said body part along said first opening on a second side of the intersection of said first and said second openings, said closure means closing said first opening, said closure means having a first wall, said wall having a reflective surface associated with it to reflect light rays through both of said first opening and said



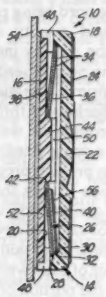
lens means, said reflective surface, said lens means and fluid in said sight glass combining to vary the size of said reflective surface as viewed through side lens means between a first, large size when the sight chamber is full with fluid and a second, relatively smaller size when said sight chamber is in any fluid condition that is less than full.

4,064,827

TEMPERATURE INDICATING DEVICE

Richard E. Darringer, Fullerton, and Robert J. Wrighton, San Gabriel, both of Calif., assignors to Telatemp Corporation, Fullerton, Calif.

Filed Aug. 19, 1976, Ser. No. 716,069
Int. Cl.[2] A01K *5/70*
U.S. Cl. 116—114 Y **12 Claims**



1. A temperature indicating device for use in indicating when the temperature of said device has been changed to a predetermined temperature which comprises:

a housing having an internal cavity and window means for exposing an indicator member located within the interior of said cavity to view from the exterior of said housing,

overcenter toggle spring means for changing from a first configuration to a second configuration by a snap action when the temperature of said spring means is changed to said predetermined temperature located within said cavity,

an indicator member located within said cavity above the bottom of said cavity so as to be physically held by said spring means so as to be visible through said window means against movement when said spring means is in said first configuration,

said spring means in said second configuration being located so that said indicator member is not physically held by said spring means and is free to fall within said cavity so as to no longer be visible through said window means,

means for dislodging said indicator member from said spring means as said spring means moves from said first to said second configuration, said means for dislodging being located within said housing.

8. A temperature indicating device for use in indicating when the temperature of said device has been changed to a predetermined temperature which comprises:

a housing having an internal disk-shaped cavity having first and second sides and a periphery and window means for exposing an indicator member located within the interior of said housing located adjacent to the center of said first of said sides of said cavity,

snap spring means for rapidly changing from a first configuration to a second configuration when the temperature of said spring means is changed to said predetermined temperature located within said cavity,

said spring means comprising a bimetal disk, the sides of which are located adjacent to the sides of said cavity and the sides of which change in configuration when said spring means is heated to said predetermined temperature,

an indicator member located within said cavity above the bottom of said cavity so as to be physically held by said spring means so as to be visible through said window means against movement when said spring means is in said first configuration,

said spring means in said first configuration holding said indicator member in proximity to said window means,

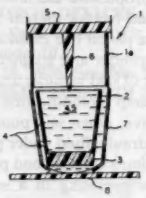
said spring means in said second configuration being located so that said indicator member is not physically held by said spring means and is free to fall within said cavity so as to no longer be visible through said window means.

4,064,828

FREEZE/THAW INDICATOR

Trevor Percival Clark, 3650 Sunnycrest Drive, North Vancouver, B. C., Canada

Filed Nov. 8, 1976, Ser. No. 740,046
Claims priority, application United Kingdom, Nov. 11, 1975, 46464/75
Int. Cl.[2] G01D *21/00*; F25B *49/00*
U.S. Cl. 116—114.5 **2 Claims**



1. A freeze-thaw indicator for evidencing when temperatures in a freezer compartment rise above a pre-determined value comprising:

a. a container having transparent side walls adapted to be placed within the freezer compartments in an upright position,

b. a liquid having pre-determined freezing and thawing temperatures and being formed as an aqueous solution of urea and magnesium chloride containing by weight 0.1 to 0.24 parts magnesium chloride, not less than one part urea and two parts water,

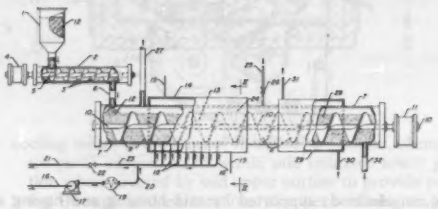
retaining means selectively allowing a float to be immersed in said liquid and retained in a selected position towards the bottom of the container until frozen in the liquid, whereby said float will rise and float in the liquid when the liquid reaches liquid state so as to evidence when ambient temperatures within the compartment have risen above the thawing temperatures of the liquid.

4,064,829

APPARATUS FOR THE PREPARATION OF SEMICONDUCTING PYROPOLYMERIC INORGANIC REFRACTORY OXIDE MATERIALS

George L. Hervert, Woodstock, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 596,707, July 17, 1975, Pat. No. 3,997,689. This application Sept. 7, 1976, Ser. No. 721,122
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—49.1 11 Claims



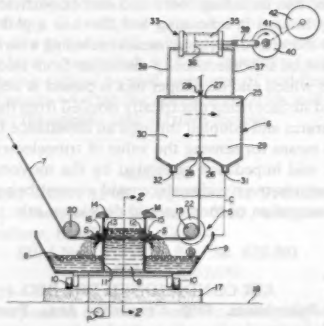
1. A continuous semi-fluidized bed system for preparing a semiconducting carbonaceous pyropolymeric inorganic refractory oxide material which comprises in combination, a horizontally disposed stationary tubular reaction section, means for introducing an inorganic refractory oxide into one end of said reaction section and means for withdrawing carbonaceous pyropolymeric inorganic refractory oxide material from the other end thereof, means for introducing a gaseous hydrocarbon pyropolymeric precursor into said reaction section at horizontally spaced points whereby said inorganic refractory oxide material is maintained in at least a semi-fluidized state during passage through said reaction section, means for withdrawing residual gaseous hydrocarbon, heating means substantially encompassing said reaction section for maintaining a pyrolyzing temperature in said reaction section, and means for maintaining a lateral movement of said contacted inorganic refractory oxide material through said reaction section.

4,064,830

APPARATUS FOR COATING AND DEWEBBING TIRE CORD FABRIC

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 3, 1976, Ser. No. 695,214
Int. Cl.[2] B05C *11/06*
U.S. Cl. 118—57 16 Claims



1. An apparatus used in the treatment of plain woven tire cord fabric, comprising:

a. means for contacting tire cord fabric with a liquid coating containing an agent for promoting the bond between cords of the fabric and rubber material used in the production of tires; and

b. means downstream of the fabric contacting means (a) for dewebbing the fabric coated with the liquid coating, said means including:

I. a chamber sealed from the ambient atmosphere;

II. means for guiding the fabric in a vertical plane through the chamber between opposing sides thereof, thereby forming two compartments separated by said fabric;

III. means for alternately circulating fluid, under pressure, to the compartments

and for alternately evacuating fluid from the compartments in correlated relation to the circulation of fluid to the compartments.

10. An apparatus used in the treatment of plain woven tire cord fabric, comprising:

a. means for contacting tire cord fabric with a liquid coating containing an agent for promoting the bond between cords of the fabric and rubber material used in the production of tires, said means including:

I. means for guiding the fabric along a horizontal pathway;

II. a supply tank for holding liquid coating, the tank including a pair of parallel weirs which liquid coating is caused to overflow;

III. a catch basin surrounding the supply tank for catching liquid coating overflowing the weirs and recirculating it to the supply tank;

IV. means for mounting the supply tank and catch basin for unitary movement; and

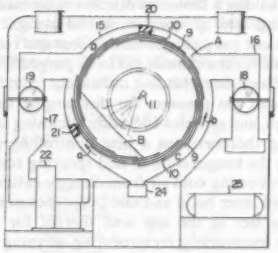
b. means downstream of the fabric contacting means (a) for dewebbing the fabric.

4,064,831

DEVICE FOR COATING GRANULAR SOLIDS

Kahei Okawara, Shizuoka, Japan, assignor to Ohkawara Mfg., Co., Ltd., Shizuoka, Japan

Filed Feb. 28, 1977, Ser. No. 772,778
Claims priority, application Japan, Feb. 27, 1976, 51-21335
Int. Cl.[2] B05B *17/00*; B05C *3/08*
U.S. Cl. 118—303 3 Claims



1. A device for coating granular solids comprising

a. a rotary drum including

a cylindrical section consisting of a plurality of overlapping circumferentially arcuated louvers radially spaced apart from each other at a suitable distance, side walls contiguous with said cylindrical section, and at least one rotary shaft extending from one of said side walls;

b. reversible drive means drivingly coupled to said rotary shaft for rotating said rotary drum in either direction,

c. a casing encircling said rotary drum,

d. coating material supply and spraying means for spraying a coating material within said rotary drum,

e. an opening formed through said the other side wall,

f. sealing means air-tightly dividing a space between said rotary drum and said casing into a supply passage and an exhaust passage,

g. a gas supply duct in communication with said supply passage, and

h. a gas exhaust duct in communication with said exhaust passage,

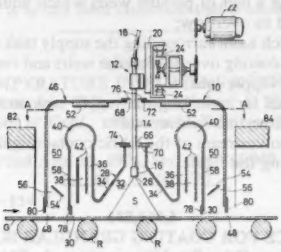
whereby when said rotary drum is rotated in one direction the discharge or escape of charged granular solids to be coated through the passages between the louvers to the exterior may be prevented whereas when the rotary drum is rotated in the other direction, the coated granular solids may be discharged through the passages between the louvers from the interior of said rotary drum.

4,064,832

APPARATUS FOR FABRICATING HEAT-REFLECTING GLASS

Yoshimasa Chujo, Musashino, and Takayoshi Kandachi, Matsusaka, both of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Mar. 29, 1976, Ser. No. 671,433
Claims priority, application Japan, Mar. 29, 1975, 50-38143
Int. Cl.[2] B05C *5/00, 15/00*
U.S. Cl. 118—323 **5 Claims**



1. An apparatus for fabricating heat-reflecting glass comprising a spraying means supported over a transfer line of a hot elongated glass sheet and reciprocably movable in a transverse direction for spraying a solution of a metal compound onto the upper surface of the glass sheet entering a spraying zone, an inner hood having a downwardly diverging intermediate portion enclosing said spraying zone and upright end portions forming exhaust gas passages on the front and rear sides of said spraying zone for the exhaust gas to be purged from said spraying zone, exhaust ducts leading outwardly from the upper ends of said exhaust gas passages for discharging the exhaust gas therethrough, and an outer enclosure enclosing said inner hood and defining therebetween a heat controlling space thereby maintaining the temperature of said spraying zone at a suitable level and preventing cold air from directly entering said spraying zone, said inner hood and said outer enclosure each having a transverse slot in the top wall thereof for receiving and guiding the transversely reciprocating spraying means.

4,064,833

TONER DENSITY CONTROLLER

Julius Gluck, Noroton Heights, Conn., and Bheema Rao Vijayendran, Berkley Heights, N.J., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 8, 1976, Ser. No. 739,605
Int. Cl.[2] B05B *5/00;* **G03G** *13/00*
U.S. Cl. 118—646 **1 Claim**

1. In a toner density controller for determining the density of a development material on a magnetic brush assembly of an electrostatic copier, the combination comprising:

a. a sump;

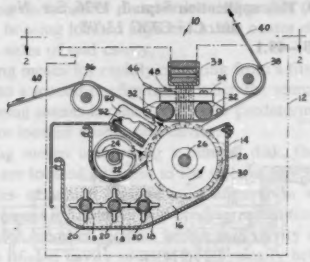
b. means disposed in said sump for mixing a development material and creating a triboelectric charge in the toner of the development material;

c. a magnetic brush rotatably disposed within said sump;

d. a housing having a window therein which is adjacent said sump;

e. a light source supported by said housing and positioned to direct light through said window;

f. a photocell located in said housing to receive light reflected by development material within said sump;



g. an electrode supported by said housing and having an opening which is in registration with said window;

h. means for supplying a charge to said electrode; and

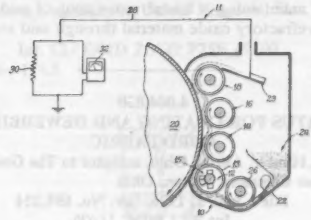
i. means for supplying a charge to said sump which is opposite in polarity to the charge supplied to said electrode.

4,064,834

APPARATUS FOR SENSING THE CONCENTRATION OF TONER IN A DEVELOPER MIX

Joseph T. Sund, Los Angeles, Calif., assignor to A. B. Dick Company, Chicago, Ill.

Filed Nov. 19, 1976, Ser. No. 743,179
Int. Cl.[2] G03G *15/06*
U.S. Cl. 118—646 **9 Claims**



1. Apparatus for sensing the concentration of toner in a developer mix including toner and carrier particles, which is primarily housed in a housing and flows in a path therefrom and back thereto comprising: means including a surface including a material triboelectrically dissimilar from said developer mix over which said developer mix is passed in contact therewith, said surface being electrically isolated from the surrounding apparatus and coupled through an impedance to the housing, and means for sensing the value of triboelectrical current through said impedance generated by the movement of said developer mix over said surface, said current being related to the concentration of toner in said developer mix.

4,064,835

AIR CONDITIONED PET BED

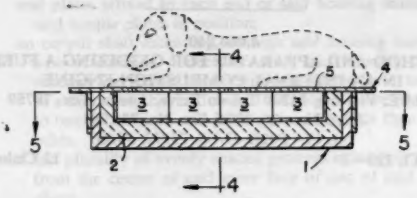
Ludwig Rabenbauer, 1495 Grandville Ave., Pontiac, Mich. 48055

Filed Oct. 6, 1976, Ser. No. 730,227
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—1 **1 Claim**

1. An air conditioned pet bed comprising,

a lower portion having sidewalls, end walls and a bottom wall,

an upper portion having a planar perforated top surface and downwardly extending flanges sized to fit closely around said sidewalls and end walls of said lower portion, insulation material lining the interior surfaces of said sidewalls, said endwalls and said bottom wall of said lower portion,



cooling means in the form of re-usable, pre-frozen, chemical ice-packs adapted to fit within said insulated lower portion when covered by said upper portion to provide cooling through said perforations to a pet reclining on said upper surface of said upper portion.

4,064,836

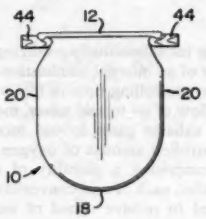
AQUATIC TANK

Jiri Taborsky, R.R. No. 1, Box 430 D-2, Palmetto, Fla. 33561

Filed July 30, 1976, Ser. No. 709,968

Int. Cl.[2] A01K *63/00*

U.S. Cl. 119—3 **4 Claims**



1. An aquatic tank of the type primarily designed to hold marine life therein; comprising in combination:

a frame having a first and a second frame end established adjacent one another with the perimeter of said frame defining a substantially closed frame area;

flexible tank means formed in the shape of a closed bag having a first and a second bag end;

entrance means in said flexible tank means for enabling insertion of said frame into the interior of said tank means, said first bag end adapted to extend through said closed frame area to coact with said second bag end for forming a two layer aquatic tank with the opening of said aquatic tank being defined by said perimeter of said frame; and

support means adapted for cooperation with said frame to support the aquatic tank relative thereto.

4,064,837

SELF-CONTAINED AQUARIUM SYSTEM

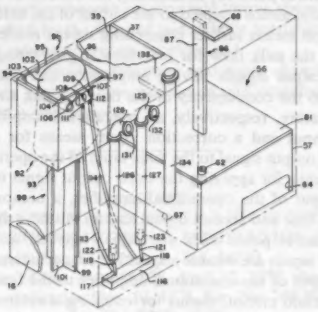
William H. Montgomery, Hayward, Calif., assignor to Aqua Plex Products, San Leandro, Calif.

Filed Nov. 17, 1975, Ser. No. 632,301

Int. Cl.[2] A01K *63/00*

U.S. Cl. 119—5 **9 Claims**

8. In an aquarium system, a tank for containing water and having a bottom wall and side walls, a dividing wall within the tank forming a main compartment and an equipment compartment within said tank, an opening in said dividing wall adjacent the bottom of the tank, a filter grid disposed in the main compartment of the tank and extending over substantially the entire bottom of the main compartment, primary filtering means carried by the filter grid, a removable filter box having an inlet and outlet for containing secondary filter material, said removable filter box being positioned within said equipment compartment adjacent the bottom of the tank with its inlet in registration with said opening in said dividing wall such that water moving through said opening passes into said removable filter box through said inlet and then through the secondary filter material therein to said outlet, air pump means and air lift



means disposed within said equipment compartment including means establishing fluid communication between said equipment compartment and said main compartment, an air pump compartment for holding said air pump means, said air pump compartment being free of water an having an air opening disposed above the surface of the water which substantially fills both the main compartment and the remainder of the equipment compartment when the tank is substantially filled with water, said air lift means utilizing air from said air pump means for supplying with water from said equipment compartment into said main compartment.

4,064,838

AUTOMATIC MILKING SYSTEMS

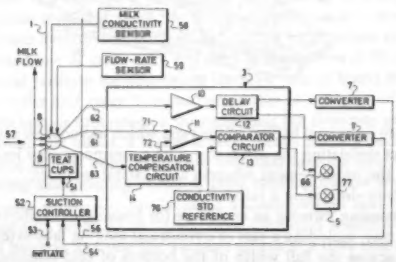
Ladislav Mukarovsky; Artur Novak, and Felix Kretschmer, all of Prague, Czechoslovakia, assignors to Ustredni statni veterinarni ustav, Prague, Czechoslovakia

Filed Apr. 29, 1976, Ser. No. 681,686

Claims priority, application Czechoslovakia, Apr. 29, 1975, 2969/75

Int. Cl.[2] A01J *7/00*

U.S. Cl. 119—14.08 **3 Claims**



1. In an automatic milking system, a plurality of suction-operated teat cups securable to the milk glands of an animal to be milked, means coupled to the teat cups for initiating suction of the teat cups to start milk flow, detection means associated with the teat cups and rendered effective during the milk flow from the animal for providing a first signal proportional to the

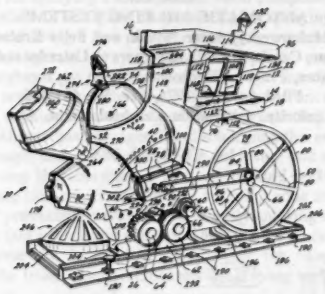
milk flow rate, threshold-operated means for yielding at its output a first control pulse when a signal applied to its input falls below a predetermined value, the duration of said first control pulse corresponding to the period over which said input signal remains below the predetermined value, means for applying the first signal to the input of the threshold means, delay means coupled to the output of the threshold means for inhibiting the passage of the first control pulse from the threshold means when such pulse does not exceed a predetermined interval, first control means coupled to the output of the delay means and rendered effective upon the passage of a delayed first control pulse for terminating the suction of the teat cups, first alarm means coupled to the output of the delay means, the detection means further comprising means rendered effective during the milk flow for individually generating second and third output signals having amplitudes individually proportional to the conductivity of the flowing milk and to the milk temperature, respectively, an operational amplifier having a main input and a correction input, means for applying the second output signal to the main input of the operational amplifier, means for applying the third output signal to the correction input of the operational amplifier, a comparison circuit having first and second inputs and an output exhibiting a second control pulse when the signals applied to the first and second inputs are outside a specified range, means for coupling the output of the operational amplifier to the first input of the comparison circuit, means for coupling a reference signal to the second input of the comparison circuit, and second control means coupled to the output of the comparison circuit and responsive to the generation of the second control pulse for terminating the suction of the teat cups.

4,064,839

AMINATED ANIMAL HABITAT

Donald James Rodemeyer, City Island, N.Y., and John Eugene Hruby, Fairfield, N.J., assignors to Metaframe Corporation, Elmwood Park, N.J.

Filed Feb. 5, 1976, Ser. No. 655,658
Int. Cl.[2] A01K *1/03*
U.S. Cl. 119—15 **1 Claim**



1. In an animal habitat of the type which includes an exercise wheel simulating the drive wheel on a steampowered locomotive, the improvement wherein said habitat includes,

a tray simulating a railway bed,

a housing forming an enclosure for housing a pet above said tray, including a pair of cylindrical locking tabs extending across the full width of the bottom of said housing, said tray including a pair of slotted cylindrical channels each engageable by an associated one of said cylindrical locking tabs for maintaining said housing in an upright position on said tray, said housing including a front housing half being molded in bas-relief to simulate said locomotive, said rear housing half being a substantially planar member having a peripheral channel engageable by the peripheral edge of said front housing for forming a channel for urine discharged by an animal in said housing,

an exercise wheel movably mounted on said habitat and in communication with said housing,

animating means movably mounted on said habitat,

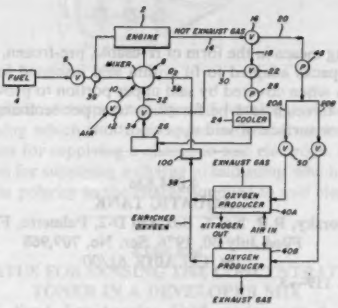
and means connecting said animating means to said exercise wheel, whereby movement of said exercise wheel actuates said animating means.

4,064,840

METHOD AND APPARATUS FOR OXIDIZING A FUEL IN AN INTERNAL COMBUSTION ENGINE

Donald E. Vierling, 11309 Toledo Drive, Austin, Tex. 78759

Filed Nov. 26, 1976, Ser. No. 744,981
Int. Cl.[2] F02B *43/08, 75/12, 33/00*
U.S. Cl. 123—3 **12 Claims**



5. In apparatus for substantially oxidizing a fuel in the combustion chamber of an internal combustion engine including a mixer, means for controlling flow of fuel to said mixer, means for controlling flow of air to said mixer, means for controlling flow of engine exhaust gases to said mixer, and means for supplying a controlled amount of oxygen to said mixer: the improvement comprising a plurality of oxygen converters arranged in parallel, each of said converters including an inner chamber adapted to receive a bed of metallic oxide and a heating chamber around said metallic oxide chamber, a first conduit connecting exhaust from said engine to said heating chamber, a second conduit for delivering air to said metallic oxide bed, a third conduit leading from said metallic oxide chamber, a valve in said third conduit, a fourth conduit leading from said valve to the oxygen supply means to said mixer, means for shutting off flow of air to said bed when said metallic oxide has been converted to a higher oxide, and control means for maintaining the temperature of said bed at that which the higher oxide is formed while air is flowing therethrough and then changing said temperature to that at which oxygen is released when it is desired to feed oxygen from said converter to said mixer, said valve being movable from a position where deoxidized air is discharged from the system while air is being fed to the converter to a position where it connects the third and fourth conduits while oxygen is being fed from the converter, whereby one of said converters can be discharged while another converter is being charged.

4,064,841

ROTARY ENGINE

Renaldo V. Jenkins, 1319 Bolton St., Norfolk, Va. 23504, and Alexander P. Sabol, 143 Queens Drive, Williamsburg, Va. 23185

Filed Aug. 18, 1976, Ser. No. 715,608
Int. Cl.[2] F02B *55/14*
U.S. Cl. 123—8.47 **12 Claims**

1. A rotary engine comprising:

a drum-like housing having a cylindrical inner surface

bounded at each end by a circular recess extending beyond the circumference of said inner surface,

the center of said circular recesses being offset from the centerline of said inner surface,

a flat circular torque plate having an inner and outer face positioned for relative rotative movement in each said circular recess,

end plates affixed to each end of said housing maintaining said torque plates in position,

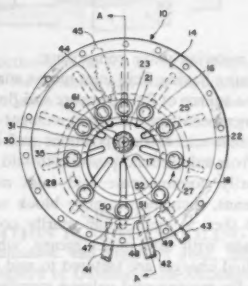
an output shaft extending through said housing having an axis of rotation concentric with said housing circular recesses and fixedly connecting said torque plates to rotate as a unit such that said axis of rotation is more proximate to one location on said housing inner surface than to any other,

a first plurality of evenly spaced grooves extending radially from the center of said inner face of one of said torque plates,

a second plurality of evenly spaced grooves extending radially from the center of said inner face of the other of said torque plates, said second plurality of grooves being equal in number to said first and directly opposed thereby,

a plurality of cylindrical roller vanes extending the length of said inner housing surface and free to turn thereon, each said roller vane having a first end in one of said first plurality of grooves and a second end disposed in said directly opposed groove in the other of said torque plates,

a cylindrical surface extending the length of said inner housing surface holding said roller vanes in constant contact thereagainst such that said inner housing surface and said cylindrical surface define respectively an outer and inner race for said roller vanes,



a slidable rotatable connection between the ends of said roller vanes and said torque plate grooves such that said vanes are freely rotatable against said outer and inner races and translatable along said grooves where said vanes revolve about said inner housing surface and the members of adjacent vane pairs contemporaneously vary in separation between a minimum and a maximum determined by said offset between said axis of rotation of said torque plates and said centerline of said housing inner surface in conjunction with the proximity of each vane to said axis of rotation;

a plurality of work chambers individually defined by said inner surfaces of said torque plates, said inner and outer races and a pair of adjacent roller vanes, said work chambers having variable individual volumes directly proportional to the separation of the members of said adjacent roller vane pairs;

a working fluid capable of expansion and contraction;

means for introducing said working fluid sequentially into each of said work chambers;

means for rotating said torque plates such that said adjacent roller vanes bounding said work chambers containing said working fluid rotate along said inner housing surface and translate along said torque plate grooves toward said axis of rotation until substantially minimum separation of said adjacent rollers is reached whereby said contained fluid is compressed and, considering said adjacent pairs of roller vanes in the direction of rotation, the leading member of said pair exceeds the trailing member in distance from said axis of rotation;

means for sequentially expanding said working fluid attaining such compression such that the resulting pressure and the relative position of said vanes to said axis of rotation forces said leading vane away from said trailing vane by continued rotation along said inner housing surface and translation along said torque plate grooves away from said axis of rotation thereby rotating said torque plates and said output shaft by the force of said slidable rotatable connections in said torque plate grooves; and

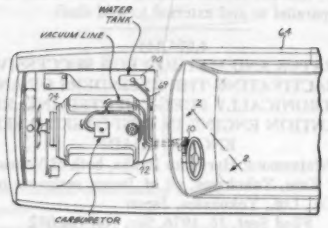
means for sequentially returning said work chambers to a condition whereby compression of said contained working fluid is begun anew.

4,064,842

INJECTOR FOR INTRODUCING A LIQUID INTO THE CYLINDERS OF AN INTERNAL COMBUSTION ENGINE

John F. Sherrill, Box L, Plymouth, Ind. 46563

Continuation of Ser. No. 568,978, April 17, 1975, abandoned.
This application Dec. 10, 1976, Ser. No. 749,388
Int. Cl.[2] F02D *19/00*
U.S. Cl. 123—25 L **10 Claims**



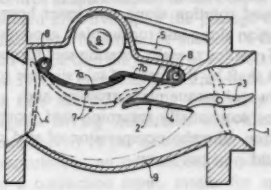
1. An injector used in combination with an internal combustion engine for introducing liquid into the cylinders of said engine, the combination comprising said injector including a housing having a bore therein, said engine cylinders constituting a vacuum source, a liquid inlet and a liquid outlet in said housing communicating with said bore, a piston slidably received within said bore and being shiftable between first and second positions therein in response to the amount of vacuum within said bore, said piston in its first position at a minimum vacuum in said bore and in its second position at a maximum vacuum in said bore, said piston carrying valve means shiftable toward one of said outlet and inlet as said piston shifts into its second position for decreasing the flow rate of liquid through the outlet and away from said one outlet or inlet as said piston shifts into its first position for increasing the flow rate of liquid through the outlet, a liquid source, means placing said liquid source in flow communication with said housing inlet, means placing said housing outlet in flow communication with said vacuum source for producing a vacuum within said bore to cause said liquid to be drawn from the liquid source through said housing and into the vacuum source at a flow rate dependent upon the position of said piston within said bore, said housing including an end wall, said one inlet or outlet in said end wall, said piston having an end face in an opposed relationship to said end wall in all operative positions of said piston within said bore, said valve means located at said end face and being positioned at said one inlet or outlet when said piston is in its second position to define in conjunction with said one inlet or outlet a liquid flow regulating orifice.

4,064,843

FUEL METERING AND INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Siegfried Holzbaur, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Sept. 29, 1976, Ser. No. 727,702
Claims priority, application Germany, Sept. 30, 1975, 2543562
Int. Cl.[2] F02B 3/12
U.S. Cl. 123—32 EJ 13 Claims



1. In a fuel injection system for internal combustion engines, said system including air flow metering means having a pivotable air flap disposed in the induction tube of the engine, said air flap being pivoted by the forces due to differences of pressure upstream and downstream thereof when the air flow is small and being pivoted by forces due to aerodynamic lift when the air flow is greater, the improvement comprising:

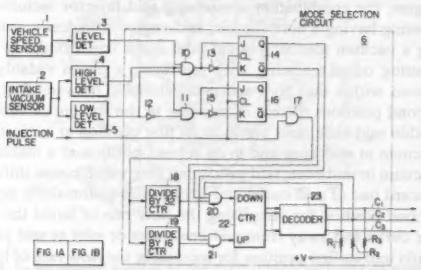
mounting said air flap on a pivotable shaft by means of a connecting bridge which has a flow profile offering substantially minimum resistance to the air flow and in such a manner that the surface defined by said air flap is substantially parallel to and external to said shaft.

4,064,844

APPARATUS AND METHOD FOR SUCCESSIVELY INACTIVATING THE CYLINDERS OF AN ELECTRONICALLY FUEL-INJECTED INTERNAL COMBUSTION ENGINE IN RESPONSE TO SENSED ENGINE LOAD

Junichiro Matsumoto; Haruhiko Iizuka, both of Yokosuka, and Fumiaki Kato, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sept. 16, 1976, Ser. No. 724,082
Claims priority, application Japan, Sept. 17, 1975, 50-111703
Int. Cl.[2] F02B 3/00
U.S. Cl. 123—32 EA 11 Claims



1. Apparatus for controlling the injection of fuel to the cylinders of an electronically fuel injected internal combustion engine mounted on a roadway vehicle having means for generating injection pulses to be applied to the injection unit of each cylinder, comprising:

means for sensing the magnitude of load exerted on said engine;

means for varying the number of active cylinders such that the number of cylinders to be fuel-injected for ignition decreases one at a time when the sensed engine load is below a first predetermined value, increases one at a time when the sensed engine load is above a second predetermined value greater than the first predetermined value and maintains constant when the sensed engine load is between the first and second values; and

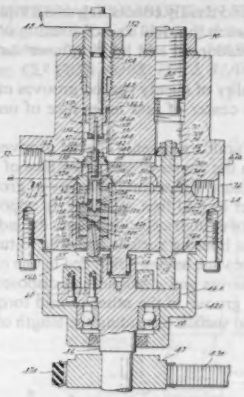
means for inhibiting the injection of fuel to one or more cylinders corresponding in number to said number of inactive cylinders.

4,064,845

METERING VALVE FOR PILOT FUEL INJECTION

Hansueli Bart, Whitehall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 22, 1975, Ser. No. 625,411
Int. Cl.[2] F02M 45/02; F02D 1/12
U.S. Cl. 123—32 G 42 Claims



37. A fluid metering valve comprising:

a valve housing having fluid inlet means adapted to be connected to a source of fluid pressure and fluid outlet means;

a valving member disposed for movement in said housing between first and second positions and operative while moving from said second position to said first position to momentarily communicate said inlet means with said outlet means, then momentarily block said communication, and then to again momentarily communicate said inlet means with said outlet means, whereby first and second fluid charges are metered to said outlet means;

first means for moving said valving member from said second position to said first position; and

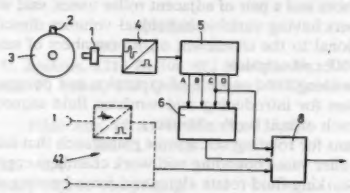
second means operative to move said valving member from said first position to said second position and then operative to release said valving member and allow said first means to move said valving member at velocities independent of said second means, while said first and second fluid charges are being metered to said outlet.

4,064,846

METHOD AND APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

Reinhard Latsch, Vaihingen, and Valerio Bianchi, Hochdorf, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 19, 1976, Ser. No. 659,495
Claims priority, application Germany, Feb. 19, 1975, 2507055
Int. Cl.[2] F02B 3/04
U.S. Cl. 123—32 EA 19 Claims



1. A method for controlling an internal combustion engine comprising the steps of

modulating the magnitude of an engine control variable at a frequency locked to the engine speed;

measuring the resultant variation in crankshaft acceleration;

comparing the phase of the modulation with the phase of the resultant crankshaft acceleration;

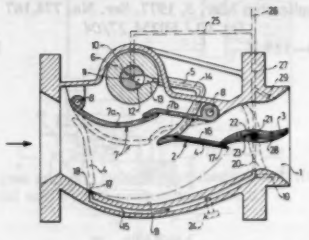
adjusting the magnitude of an engine control variable according to said comparison of phase.

4,064,847

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Siegfried Holzbaur, Stuttgart, and Horst Barth, Asperg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 7, 1976, Ser. No. 730,615
Claims priority, application Germany, Oct. 17, 1975, 2546560
Int. Cl.² F02B *3/12*
U.S. Cl. 123—32 EJ **14 Claims**



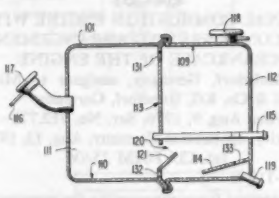
1. A fuel injection system for internal combustion engines, including means for injecting fuel into the air induction tube of the engine at a location upstream of the main throttle valve, the improvement comprising means for delivering a quantity of fuel for engine idling to a location in said induction tube lying downstream of the said main throttle valve.

4,064,848

EQUALIZATION TANK FOR COOLING LIQUID

Rolf Pabst, Neuhausen, and Siegfried Jenz, Illingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft and Suddeutsche Kuhlerfabrik Julius Fr. Behr, both of, Germany

Filed Aug. 1, 1975, Ser. No. 601,330
Claims priority, application Germany, Aug. 3, 1974, 2437502
Int. Cl.² F01P *3/22*
U.S. Cl. 123—41.54 **19 Claims**



6. An equalization tank for volume equalization and air separation of a liquid heat carrier flowing through a circulating system, especially for a circulatory system for combustion engine cooling spaces and the like, comprising:

separation chamber means,

air chamber space means arranged above said separation chamber means,

venting means communicating the air chamber space means and the separation chamber means for accommodating escape of entrapped air from the liquid flowing through the separation chamber means to the air chamber space means,

the separation chamber means being constructed and arranged to form liquid-air separating means and including a plurality of separate separation chambers, a first of the separation chambers including an inlet portion coupled with a separation flow entrance leading from the circulating system and an outlet portion coupled direcly with a second of the separation chambers, the outlet portion being constructed and arranged to permit passage therethrough of at least a substantial portion of the flow of liquid through the first separation chamber to the second separation chamber,

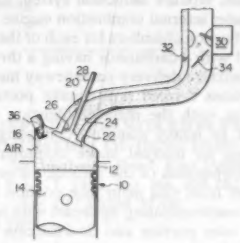
the outlet portion being provided with a connection means for liquid enriched with bubbles between the first separation chamber and the second separation chamber and a connection means for liquid low in bubbles between the first separation chamber and the second separation chamber, the connection means for liquid enriched with bubbles being located geodetically between the connection means for liquid low in bubbles and the air chamber space means.

4,064,849

INTERNAL COMBUSTION ENGINE

Takashi Nagasawa, Miura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 15, 1975, Ser. No. 541,105
Claims priority, application Japan, Jan. 17, 1974, 49-8243
Int. Cl.² F02B *17/00*; F01L *3/22*
U.S. Cl. 123—75 B **3 Claims**



1. In an internal combustion engine

a cylinder;

a reciprocating piston in said cylinder;

a cylinder head closing one end of said cylinder, said reciprocating piston and said cylinder head cooperating to form in said cylinder a combustion chamber;

said cylinder head having an air intake port opening directly into said cylinder;

an air intake passageway terminating at said air intake port for admitting air into said cylinder through said air intake port;

said cylinder head having a combustible mixture intake port opening directly into said cylinder, said combustible mixture intake port being disposed in said air intake passageway and radially inwardly of said air intake port;

a combustible mixture intake passageway terminating at said combustible mixture intake port for admitting a combustible mixture into said cylinder through said combustible mixture intake port; and

an intake valve having a valve stem and valve head, said intake valve being reciprocable mounted in said cylinder head, said valve head closing said air intake port when said intake valve is in a closed position, said valve head having a portion constructed and arranged so as to be received in said combustible mixture intake passageway to close said combustible mixture intake port until said valve head is spaced from said air intake port by a predetermined amount, said portion of said valve head opening said combustible mixture intake port when said valve head is spaced from said air intake port beyond said predetermined amount, said valve head being positioned when said intake valve is in open positions to direct air from said air intake port toward walls of said cylinder to form an air film in areas adjacent the cylinder walls and a crown of said piston, this air film embracing the combustible mix-

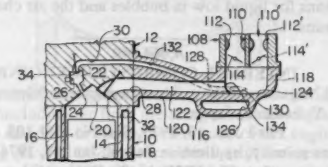
ture after it is emitted from said combustible mixture intake port.

4,064,850

INTERNAL COMBUSTION ENGINE WITH MAIN AND AUXILIARY COMBUSTION CHAMBERS

Yasuhiko Nakagawa, Fujisawa; Masahiro Sasaki; Teruyuki Ito, both of Yokohama, and Tosimitu Matuoka, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 16, 1976, Ser. No. 649,596
Claims priority, application Japan, Jan. 17, 1975, 50-7002
Int. Cl.[2] F02B *19/10*
U.S. Cl. 123—75 B **19 Claims**



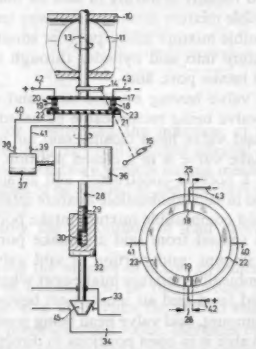
1. An air-fuel mixture induction system for an automotive multiple-cylinder internal combustion engine having main and auxiliary combustion chambers for each of the engine cylinders and combined with a carburetor having a throttle valve, comprising main mixture delivery passageway means having internal wall portions formed with intake ports respectively in communication with the main combustion chambers of the cylinders and an intake manifold consisting of a main tube portion having an internal space communicating with the carburetor downstream of the throttle valve and runner portions branched from said main tube portion and formed with passageways communicating upstream with said internal space in said main tube portion and downstream with said intake ports, and auxiliary passageways each providing communication between each of the auxiliary combustion chambers and said internal space in said main tube portion through an opening in at least one of said internal wall portions.

4,064,851

SERVO CONTROLLED EXHAUST GAS RECYCLE SYSTEM

Wolf Wessel, Oberriexingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 12, 1976, Ser. No. 713,855
Claims priority, application Germany, Sept. 5, 1975, 2539484
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 B **11 Claims**



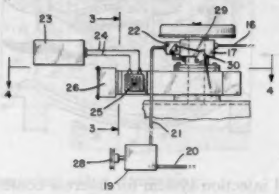
1. In an exhaust recycle system for an internal combustion engine, said system including adjustable valve means adapted to be opened and closed in accordance with the position of the throttle of the engine, the improvement comprising switch means, composed of two complementary switch parts, the first of said switch parts being attached to and moving with said valve means and the second of said complementary switch parts being attached to and moving with said throttle; whereby the cooperation of said first and second switch parts provides a switching action for opening and closing said adjustable valve means.

4,064,852

MICROWAVE ENERGY APPARATUS AND METHOD FOR INTERNAL COMBUSTION ENGINES

Hal Fulenwider, Jr., P.O. Box 971, Palm Beach, Fla. 33480

Continuation of Ser. No. 629,374, Nov. 6, 1975, abandoned. This application Mar. 3, 1977, Ser. No. 774,167
Int. Cl.[2] F02M *27/04*
U.S. Cl. 123—119 E **12 Claims**



1. A device for vaporizing and heating liquid in combination with an internal combustion engine having inlet means to cylinders for combustion comprising means for supplying liquid to said inlet means, and microwave generating means for subjecting said liquid to microwave energy to volatilize and heat said liquid for combustion prior to entry by said liquid into said cylinders, substantially L shaped wave guide means for directing said microwave energy from said generating means to said inlet means and for dissipating excess microwave energy.

4,064,853

INTERNAL COMBUSTION ENGINE WITH A PRESSURE-COMPENSATING ARRANGEMENT IN THE CRANKCASE OF THE ENGINE

Ernst Hatz, Ruhstorf, Germany, assignor to Motorenfabrik Hatz GmbH & Co. KG, Ruhstorf, Germany

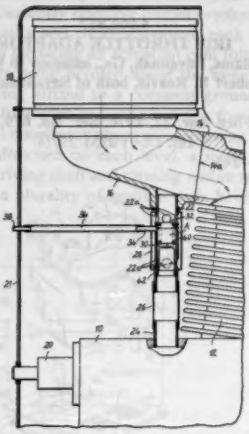
Filed Aug. 9, 1976, Ser. No. 712,779
Claims priority, application Germany, Aug. 12, 1975, 2535950
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 B **6 Claims**

1. An arrangement for compensating the pressure in a crankcase of an internal combustion engine, comprising:

conduit means for providing a fluid connection between said crankcase and a suction pipe for said engine, said conduit means including an operating chamber separate from said fluid connection and auxiliary conduit means for connecting said operating chamber to atmospheric pressure, said operating chamber being directly formed in said fluid connection;

bypass passageway means for providing passage of a fluid from said crankcase to said suction pipe around said operating chamber, said bypass passageway means comprising tubular jacket means enclosing and being spaced from said fluid connection along the length of said operating chamber; and

a shut-off member mounted in said operating chamber and adapted to make or interrupt the connection between said



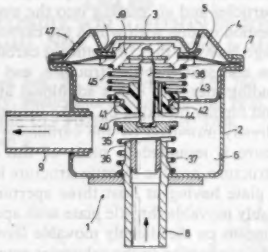
crankcase and said suction pipe through said fluid connection and said bypass passageway means.

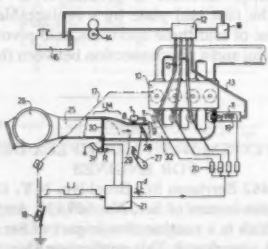
4,064,854

AIR VALVE FOR A FUEL INJECTION SYSTEM

Siegfried Fehrenbach, Markgroningen, and Alfred Feuerbacher, Schwieberdingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 2, 1976, Ser. No. 737,934
Claims priority, application Germany, Nov. 15, 1975, 2551340
Int. Cl.[2] F02M *69/00, 39/00, 7/00*
U.S. Cl. 123—139 AW **8 Claims**





1. An air valve for a fuel injection system of a mixture-compressing externally ignited internal combustion engine, the system comprising: a suction tube into which fuel is injected and within which an air metering member and an arbitrarily displaceable throttle valve are mounted in succession in the direction of air flow; and a bypass line connecting together the sections of the suction tube upstream and downstream of the throttle valve, wherein the cross section of the bypass line is varied by means of an air valve, the air valve comprising:

a. a housing;

b. a membrane within the housing and dividing the space within the housing into a first and second chamber;

c. a movable valve component mounted to control the cross-sectional area of the bypass;

d. a guide plate;

e. a connecting member guided by the guide plate and connecting the membrane to the movable valve component;

f. a guide spring mounted to bias the movable valve component in an open direction;

g. a first line; and

h. pressure spring situated in the second chamber, wherein:

i. the first chamber communicates with atmosphere;

ii. the second chamber communicates with the suction tube section upstream of the throttle valve via the first line;

iii. the first line is closable by the movable valve component; and

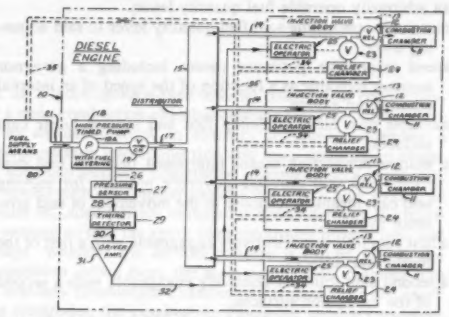
iv. the membrane is concurrently acted upon by the guide spring via the movable valve component and by the pressure spring.

4,064,855

PRESSURE RELIEF AT FUEL INJECTION VALVE UPON TERMINATION OF INJECTION

Lloyd E. Johnson, 700 Highview Road, East Peoria, Ill. 61611

Filed Feb. 17, 1976, Ser. No. 658,252
Int. Cl.[2] F02M *51/06*
U.S. Cl. 123—139 DP **19 Claims**



1. In a fuel injection apparatus for an internal combustion engine having a combustion chamber, said apparatus including a fuel injection valve having a downstream side through which fuel is injected into said chamber and an upstream side, fuel pulse supply means connected to said upstream side for supplying metered and timed pulses of fuel to said valve for injection into said chamber, said pulses each having a start and an end, the improvement comprising:

a normally closed relief valve having an intake opening communicating with the upstream side of the injection valve and a discharge opening;

power means connected to the relief valve for opening the relief valve to permit communication between the intake and discharge openings in timed relationship to arrival at the injection valve of said ends of pulses of fuel flow; and

means communicating with said discharge openings to receive fuel that may flow from the intake to the discharge openings when the relief valve is open.

4,064,856

CONTROL MECHANISM FOR INJECTION PUMP

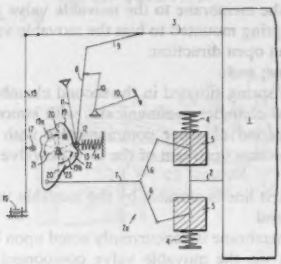
Ulrich Augustin, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Continuation of Ser. No. 469,451, May 13, 1974, abandoned. This application July 19, 1976, Ser. No. 706,296

Claims priority, application Germany, May 15, 1973, 2324419; May 15, 1974, 2401727

Int. Cl.[2] F02M *39/00*

U.S. Cl. 123—140 R **86 Claims**



1. In an internal combustion engine having a predetermined operating range and an injection pump which supplies fuel to said engine over said operating range, a control mechanism for controlling said injection pump, said control mechanism comprising:

a control rod member axially displaceable in the injection pump for directly varying the injection quantity of said pump as a function of the position of said control rod member,

a freely movable injection pump adjusting lever,

means for connecting the control rod member with said adjusting lever,

an arbitrarily operable fuel quantity lever,

means for connecting said fuel quantity lever to said adjusting lever,

speed responsive governor means including a governor member movable as a function of the speed of an internal combustion engine,

movable cam means defining first and second linear cam surfaces,

a motion connecting means interposed between said cam means and said movable governor member for moving said cam means in response to the movement of said governor member,

a first cam follower selectively engageable with a first of the linear cam surfaces,

a second cam follower relatively engageable with a second of the linear cam surfaces,

means for mounting said first cam follower to said adjusting lever at a fixed location such that the position of said adjusting lever controls the position of said control rod member in response to the position of the cam means over a first portion of the operating range of said engine,

means for mounting said second cam follower to said control rod member such that when said second cam follower contacts said cam means over a second portion of the operating range of said engine, a displacement of said control rod member in a direction permitting higher quantities of fuel to be injected in the engine is blocked,

said means for mounting said first cam follower to said adjusting lever, said means for mounting said second cam follower to said control rod member, said means for connecting said control rod member with said adjusting lever, and said means for connecting said fuel quantity lever to said adjusting lever being arranged with respect to one another so that in each case only one of said first cam follower and said second cam follower respectively contact their associated cam surfaces with the respective cam followers being alternatingly mutually disengageable from their associated cam surfaces.

4,064,857

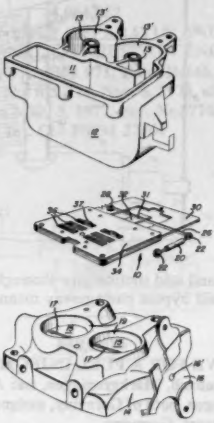
IRIS THROTTLE ADAPTOR

David R. Williams, Savannah, Ga., assignor to William O. Plunkett and Robert E. Reavis, both of Savannah, Ga., part interest to each

Filed Apr. 22, 1976, Ser. No. 679,312

Int. Cl.[2] F02M *29/00*

U.S. Cl. 123—141 **11 Claims**



1. In a carburetor having a liquid gasoline containing chamber, an air passageway, an atomizing venturi in said air passageway and connected to the gasoline chamber for the induction of gasoline thereinto by the passage of inducted air through the passageway, the improvement comprising; a throttle structure for association with the air passageway to control the gasoline particles and air passing into the manifold of the internal combustion engine with which the carburetor is used, actuating linkage between the conventional carburetor actuating mechanism and said throttle structure, and said throttle structure including means to effect additional atomization of the gasoline and further breaking up of the suspended gasoline particles as already atomized by the carburetor venturi, the throttle structure is mounted in place of the conventional throttle disk structure, and the throttle structure includes a flat main support plate having at least three apertures therein, a single flat slidably movable throttle plate with apertures therethrough, and means on the slidably movable throttle plate for actuation by the connection to the caburetor actuating mechanism, the means on the slidably movable throttle plate for actuation thereof includes a pivotal lever appropriately mounted on the first said plate by a replaceable pivot block mounted in one of said three apertures, said pivotal lever having a slot therein, and a pin connection between the slot and the throttle plate.

4,064,858

IGNITION SYSTEM WITH MULTIPLEX DISTRIBUTOR FOR ENGINES

Louis Forde, 482 Berriman St., Brooklyn, N.Y. 11208

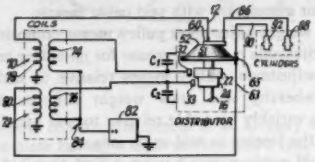
Continuation-in-part of Ser. No. 665,125, Aug. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 482,232, June 24, 1974, abandoned. This application Dec. 13, 1976, Ser. No. 750,274

Int. Cl.[2] F02P *1/00, 5/04;* H01H *29/16*

U.S. Cl. 123—148 DS **12 Claims**

1. An ignition system for a multi-cylinder internal combustion engine comprising in combination, a driving shaft, a plu-

rality of rotatable cam means mounted on said shaft in an axially spaced arrangement, each of said cam means having a number of lobes for actuating one of a plurality of substantially identical and concurrently operable circuit breaker assemblies disposed in an axially spaced arrangement, each said circuit breaker assemblies including an actuating cam follower, all of said cam followers being pivoted about the same pivot arm, said pivot arm being affixed to a common ground plate and each of said cam followers engaging a respective one of said cams, a multi-level distributor cover means having at least one terminal contact disposed on each level, a multi level rotor mounted on said driving shaft and rotating within said distributor cover means, a plurality of ignition coils having primary



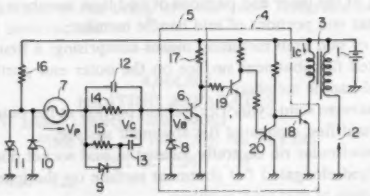
and secondary windings, said ignition coils corresponding in number to the number of levels of said multi-level rotor and said primary windings being connected to a respective one of said breaker assemblies at one end and to a power source at the other end, said multi-level rotor including an input connection for each level connected to a respective one of said secondary windings, each level of said multi-level rotor having an axially spaced and axially aligned output connection tip, said output connection tips having a different radius for each level and connecting the input of each rotor level with said at least one contact on the corresponding level of the multi-level distributor cover means, said contacts being connected to the engine spark plugs.

4,064,859

SEMICONDUCTOR IGNITION SYSTEM

Seiichi Kashiwazaki, Naka, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 20, 1976, Ser. No. 650,766
Claims priority, application Japan, Jan. 20, 1975, 50-7746
Int. Cl.[2] F02P *9/00, 7/06, 5/08*
U.S. Cl. 123—148 E **12 Claims**



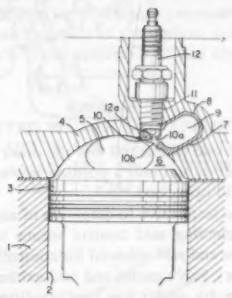
1. A semiconductor ignition system comprising:
an ignition coil having a primary winding and a secondary winding;
spark plugs;
a first connection means to connect the secondary coil of said ignition coil to said spark plugs;
a first transistor having emitter, collector and base electrodes;
a second connection means which connects the emitter and collector electrodes of said first transistor to the primary coil of the ignition coil and to a d-c current supply means in series;
a pick-up coil which generates a-c signals in synchronism with the revolution of the engine;
a second transistor which detects the output of said pick-up coil; and
a switching means which supplies current to the base of said first transistor responsive to the output of said second transistor, for the purpose that the primary current of the ignition coil is controlled responsive to the output of said pick-up coil so that a high voltage which will be fed to said spark plugs is generated on the secondary winding;
the improvement characterized by a parallel circuit of a resistor and a diode, a capacitor connected in series with the parallel circuit and means for connecting said series circuit of said parallel circuit and said capacitor to said pick-up coil and the base of said second transistor.

4,064,860

SPARK-IGNITION ENGINE FOR LEAN AIR-FUEL MIXTURE

Takashi Kato, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 31, 1975, Ser. No. 645,814
Int. Cl.[2] F02B *19/12, 19/18*
U.S. Cl. 123—191 S **11 Claims**



1. In a spark-ignition-type internal combustion engine having a main combustion chamber equipped with an intake valve for an air-fuel mixture, an auxiliary combustion chamber, a transfer passage interconnecting said main combustion chamber with said auxiliary combustion chamber, and a spark plug associated with the transfer passage, the spark plug having an annular threaded portion mounted in a wall defining the transfer passage so that the spark plug electrodes project into said passage, whereby the air-fuel mixture is forced during the compression stroke from the main combustion chamber into the auxiliary combustion chamber and is ignited by the spark plug electrodes, the combustion gas in the auxiliary combustion chamber is injected through said passage into the main combustion chamber, and thus the air-fuel mixture in the main combustion chamber is quickly ignited and combusted, comprising the improvement wherein said transfer passage has a first passage portion of enlarged cross-sectional area and at least one additional passage portion of a smaller cross-sectional area, said electrodes being positioned in said first portion of said transfer passage, and said first portion having a length as measured in the flow direction of the passage which is greater than the outside diameter of the threaded portion of the spark plug.

4,064,861

DUAL DISPLACEMENT ENGINE

William J. Schulz, R-239, West Cornwall, Conn. 06796

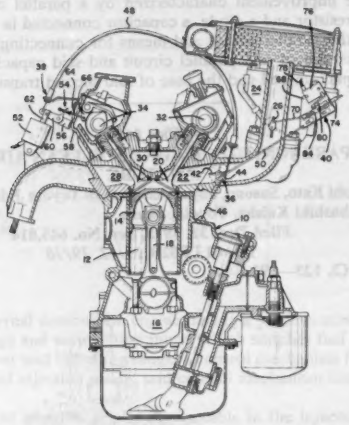
Filed Aug. 10, 1976, Ser. No. 713,106
Int. Cl.[2] F02D *13/06*
U.S. Cl. 123—198 F **9 Claims**

1. An apparatus for disabling at least one selected cylinder of

a conventional four cycle, multi-cylinder, internal combustion engine under light load conditions in order to effect operational economy, said apparatus comprising:

auxiliary valve means located in an intake manifold leading to each selected cylinder;

valve lock-up means acting on an exhaust valve of each selected cylinder to lock said exhaust valve in an open condition, said lock-up means comprising a solenoid having a piston rod, a linkage assembly one end of which is



attached to said piston rod and the other end of which is movable out of and into a position in which said exhaust valve is held open; and

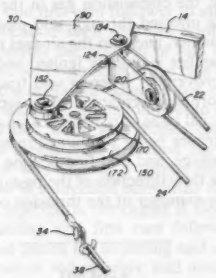
control means responsive to actuation of an accelerator and means connecting said control means to said auxiliary valve means and said solenoid for controlling operation of said auxiliary valve means and said exhaust valve lock-up means whereby, under low load conditions, said selected cylinder is disabled by closure of said auxiliary valve and locking open said exhaust valve.

4,064,862

COMPOUND BOW

Norman Arlo Groner, Kalkaska, Mich., assignor to Victor United, Inc., Chicago, Ill.

Filed Mar. 31, 1976, Ser. No. 672,150
Int. Cl.[2] F41B 5/00
U.S. Cl. 124—23 R 10 Claims



1. A compound bow for propelling an arrow comprising:

handle means for gripping and holding the bow;

a pair of limb means extending outwardly from opposite ends of said handle means for storing energy to propel the arrow;

a pair of cable means attached to the bow for causing flexing movement of said limb means;

a draw string means connected to said cable means for association with an arrow;

eccentric wheel means attached to outer end portions of each of said limb means for association with said cable means;

idler pulley means attached to outer end portions of each of said limb means for association with said cable means;

cable attachment means mounted on each of the outer end portions of said handle means for fixedly attaching said cable means to said bow;

draw weight adjustment means including pulley means mounted on each of the outer end portions of said handle means for association with said cable means;

said draw weight adjustment pulley means comprising:

variably adjustable mounting means for mounting said draw weight adjustment pulley means relative to said handle means whereby said draw weight adjustment pulley means is variably locatable relative to said handle means to vary the tension in said cable means;

each of said cable means having a first terminal portion attached to one of the outer end portions of said handle means by one of said cable attachment means, a first intermediate portion extending from said one cable attachment means to one of said idler pulley means on the outer end portion of the one limb means extending outwardly from the one of the outer end portions of said handle means;

a second intermediate portion extending from said one idler pulley means to one of said draw weight adjustment pulley means on the one of the outer end portions of said handle means;

a third intermediate portion extending from said one of said draw weight adjustment pulley means to one of said eccentric wheel means on the outer end portion of the other limb means; and

a second terminal portion extending from said one of said eccentric wheel means and connected to one adjacent end of said draw string means.

10. A bow for propelling an arrow comprising:

a handle member for gripping and holding the bow;

a pair of limb means extending outwardly from opposite ends of said handle means for storing energy to propel an arrow;

limb mounting means for removable and adjustable mounting of the inner end portions of said limb members on the outer end portions of said handle member;

each of said limb mounting means comprising: a first elongated flat abutment surface on the outer end portion of said handle member;

a transverse semi-cylindrical socket portion at the outer end of said first elongated flat abutment surface;

a semi-circular rib centrally located in said socket portion;

a second elongated flat abutment surface on the inner end portion of said limb member;

a transverse semi-cylindrical rib portion at the inner end of said second elongated flat abutment surface;

a semi-circular groove centrally located in said semi-cylindrical rib portion; said semi-cylindrical rib portion being mounted in rotatable supportive engagement with said semi-cylindrical socket portion with said semi-circular rib being in rotatable supportive engagement with said semi-circular groove and preventing axial displacement of said semi-cylindrical rib portion relative to said semi-cylindrical socket portion; and

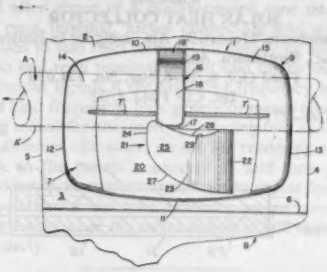
threaded fastening means for fixedly adjustably receiving said inner end portion of said limb member to said outer end portion of said handle member.

4,064,863

ARROW REST

James C. Helmick, Grayling, Mich., assignor to Victor United, Inc., Chicago, Ill.

Filed June 11, 1976, Ser. No. 694,938
Int. Cl.[2] A41B 5/00
U.S. Cl. 124—41 A 9 Claims



1. An arrow rest for attachment to an archery bow including, a base plate having a front surface and a rear attachment surface, said rear surface engageable with a bow surface whereby said base plate remains a stationary member with said front surface fixedly disposed relative thereto, a stationary guide rib on the upper portion of said front surface and provided with a fixed outer surface spaced outwardly from said plate front surface extending generally vertical downwardly from the uppermost edge of the base plate, a flap means of resilient material having a rear portion fixedly attached to the lower portion of said plate front surface at a point disposed rearwardly of said guide rib and including a forwardly extending main body section provided with a free end, said flap means when in an at-rest position angularly disposed relative to said base plate with said free end spaced away from and forwardly of the vertical plane of said guide rib, said flap means being of substantial depth as compared to its width at the area where the flap means attaches to the base plate, and said flap means being provided with an concave uppermost arrow shaft supporting surface juxtaposed said guide rib whereby an arrow shaft disposed upon said rest is supported upon its lower periphery by said flap means supporting surface and the lateral periphery of an arrow is biased into engagement with said rib outer surface by said flap means, and rearward drawing of an arrow frictionally displaces said resilient flap means rearwardly from its at-rest position while forward release of an arrow frictionally displaces said resilient flap means forwardly past its at-rest position with said flap means returning to its at-rest position after passage of an arrow over said flap means said entire arrow rest being of a one piece integrally molded resilient construction.

4,064,864

HEATING APPARATUS

Marlin V. Husa, Liberty, Nebr. 68381

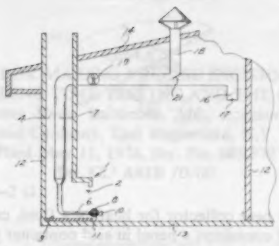
Filed Oct. 12, 1976, Ser. No. 731,186
Int. Cl.[2] F24B 7/04
U.S. Cl. 126—121 7 Claims

1. Apparatus for heating an enclosed area having a firebox open on one side toward the area to be heated and a chimney in fluid communication with the firebox on one end and the atmosphere outside the enclosed area on the other end, said apparatus comprising:

a. a plurality of tubular arm members, said arm members each having a first end and a second end with a directional change thus forming a curve therebetween, said first ends of said arm members adapted to project through the open side of the firebox and said second ends of said arm members adapted to project toward the chimney

b. an elongate conduit having first and second ends, said first end of said conduit fixed to and in fluid communication with said second ends of said arm members, said conduit adapted to extend at least partially along and within the chimney and terminating at said second end of said conduit within the enclosed area;

c. an air moving means in fluid flow communication with said conduit intermediate said first and second ends thereof for moving air from said conduit second end through said elongate conduit; and



d. an open-ended elongate tubular chamber affixed to and in sealed fluid communication with said first ends of said arm members, said chamber having a multiplicity of orifices along the length thereof directed toward said curved portions of said arm members, the open ends of said chamber being located outside of the firebox; and

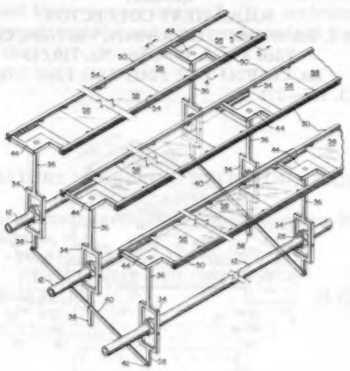
e. a valve in each of the open ends of said chamber.

4,064,865

SOLAR ACTUATED BOILER AND APPURTENANCES

Walter L. Depew, 3111 W. 54th Ave., Denver, Colo. 80221

Filed Apr. 28, 1975, Ser. No. 572,083
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 10 Claims



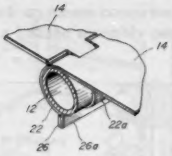
1. A solar boiler comprising:

at least one elongated header pipe, a plurality of ganged, discrete, movable mounted converging lenses adapted to provide a point image positioned adjacent to but spaced from the header pipe with each lense focused thereon to produce an individual and discrete focused point image on the header pipe corresponding to each lense, and tracking means connected to each lense to automatically and synchronously move the lenses through the azimuth to follow a solar body and maintain the focused, concentrated point image of the solar body on the header pipe, whereby the boiler may be maintained in an advantageous configuration for the collection of solar energy on the header pipe by the lenses as the relative position of the solar body and the boiler header pipe change.

4,064,866
FLAT PLATE SOLAR HEAT COLLECTOR

Philip A. Knight, Jr., Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 24, 1976, Ser. No. 689,608
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 7 Claims

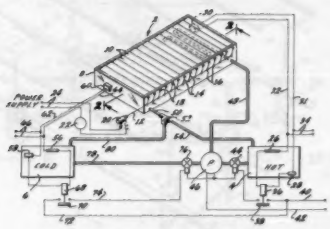


1. A solar heat collector for heating a fluid, comprising an open-topped container, a panel in said container positioned to be contacted by solar radiation entering the container through the open top, said panel comprising a number of collector plates disposed substantially in edge-to-edge relation in a common plane, fluid-conducting conduit disposed in engagement with said panel along adjoining edges of said plates, and gripping means on said plates encircling adjacent sections of said conduit for retaining the conduit in efficient heat-conducting relation with the plates, said gripping means comprising slotted areas disposed in each plate adjacent an adjoining edge and defining gripping members therebetween, the gripping members of a respective plate being interlocked with gripping members on an adjacent plate and defining therewith a channel within which said conduit is located, and a transparent cover disposed over the open top of the container and transmissive to solar radiation.

4,064,867
SOLAR HEAT COLLECTOR

Robert J. Schlesinger, 15150 Raymers, Van Nuys, Calif. 91405

Filed Aug. 2, 1976, Ser. No. 710,613
Int. Cl.[2] F24J 3/02; F24H 7/00; F28F 7/00
U.S. Cl. 126—271 10 Claims

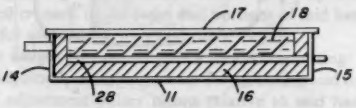


1. A solar heat collector system comprising:
a solar heating enclosure;
a first receptacle for a heated liquid medium;
a second receptacle for a cooled liquid medium;
heat transfer means within said enclosure for transferring heat to or from a liquid medium;
a closure for said enclosure which closure is transparent to radiant energy from the sun;
first means to convey a liquid medium from said first receptacle through said heat transfer means and then back to said first receptacle when said closure is in a closed position;
second means to convey a liquid medium from said second receptacle through said heat transfer means and then back to said second receptacle when said closure is in an opened position;
said transparent closure being made up of a plurality of closure members, and
means to move said closure members to an opened or a closed position in response to the level of radiant energy which impinges on said closure members.

4,064,868
SOLAR HEAT COLLECTOR

Otto J. Nussbaum, Huntsville, Ala., assignor to Halstead Industries, Inc., Scottsboro, Ala.

Filed Oct. 8, 1976, Ser. No. 731,030
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 12 Claims

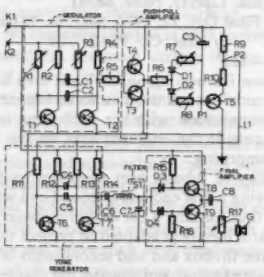


1. A heat collector for absorbing solar radiation, said collector comprising:
a collector panel defined by a thermal insulated backwall with projecting insulated side walls carrying an outwardly-spaced cover plate adapted to conduct incident solar energy toward said backwall,
a conduit extending along in a spaced-apart relation between said backwall and said cover plate to conduct a fluid medium for heating within said panel, and
a plurality of spaced-apart heat transfer fins in intimate contact with said conduit to absorb solar radiation and thereby increase the flux of heat into said conduit for heating the fluid medium therein, said heat transfer fins projecting from said conduit in a generally radial direction with respect to the flow direction of the fluid medium within said conduit, said heat transfer fins each essentially including a bent fin portion that projects along within the space between said conduit and said insulated backwall toward an adjacent fin.

4,064,869
APPARATUS FOR REGULATING THE BREATHING PATTERN

Peter Bernard Defares, Emmalaan 9, Driebergen; Wouter Wies van der Schaar, Laagschardammerweg 3, Schardam, and Eduard Theodorus Verveen, Westlandgracht 87''', Amsterdam, all of Netherlands

Filed Oct. 16, 1975, Ser. No. 623,075
Claims priority, application Netherlands, Oct. 16, 1974, 7413569
Int. Cl.[2] A61B 5/08; A61H 31/00
U.S. Cl. 128—2 R 15 Claims



1. Portable apparatus for regulating the breathing pattern of patient, in particular as a remedy against the hyperventilation

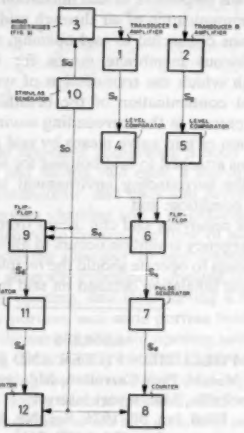
syndrome, comprising a sensor adapted to be attached to the body of the patient, said sensor including means responsive to the contractions and expansions of the chest for producing sensor output signals, means connected to said sensor for converting the output signals of said sensor into short control impulses of which the repetition frequency is equal to the breathing frequency, timing means adapted to deliver an output signal after elapse of a predetermined time interval and having a reset terminal, means connecting said signal convertng means to said reset terminal for supplying said control impulses to said reset terminal so that said timing means only provides output signals if the breathing frequency is below a prescribed limit frequency, tone generator means connected to said timing means for alternately producing two audible tones having a different character, means for rendering said tones perceptible to the patient connected to said tone generator means, and means connected to said timing means for preventing the operation of said tone generator means connected to said timing means when the ouput signals of said timing means occur regularly.

4,064,870

METHOD AND DEVICE FOR EVALUATING NERVE IMPULSE PROPAGATION VELOCITY AND LATENCY OF ELECTRODERMAL REFLEXES

Ioan Florin Dumitrescu; Constantin Cojocaru, and Constantin Bolintineanu, all of Bucharest, Romania, assignors to Centrul de Protectia si Igiena Muncii, Bucharest, Romania

Filed May 19, 1976, Ser. No. 687,656
Int. Cl.[2] A61B *5/05*
U.S. Cl. 128—2 N **3 Claims**



1. A method of evaluating nerve-impulse-propagation velocity through vegetative fibers of a human subject and the latency of electrodermal reflexes, comprising the steps of:

disposing two electrodes with a predetermined spacing on the palm of the hand of a subject in a common innervation area;

generating a stimulus to trigger a nerve response in said subject;

initiating the product of a train of first pulses simultaneously with the generation of said stimulus;

counting said first pulses;

terminating the counting of said first pulses upon detection of an electrodermal reflex at one of said electrodes, the resulting count of the first pulse representing the period of latency of electrodermal reflexes;

initiating a train of second pulses upon the detection of the electrodermal reflex at said one of said electrodes;

counting said second pulses;

terminating the counting of said second pulses upon the detection of a corresponding electrodermal reflex at the other of said electrodes; and

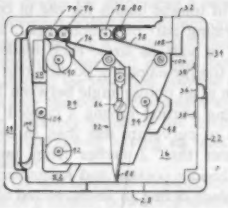
establishing the nerve-impulse progagation velocity of the subject by dividing the distance between said electrodes by the sum of the pulse durations and pulse intervals of the counted second pulses.

4,064,871

DEVICE FOR MAKING PRECISE INCISIONS FOR BLEEDING TIME TESTING AND THE LIKE

Woodrow James Reno, Baltimore, Md., assignor to Becton, Dickinson and Company, East Rutherford, N.Y.

Filed May 11, 1976, Ser. No. 685,370
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 G **5 Claims**



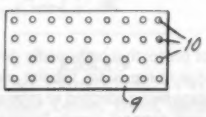
1. A device for the formation of precise incisions for clinically testing the bleeding time of human or animal subjects comprising: a housing; a surface on said housing; a slot extending along said surface defining a longitudinal opening into said housing; a blade mounted for movement within said housing, said blade having a tip end directed toward said slot; and, moving means mounted within said housing and operationally engaging said blade to move said blade (1) a predetermined distance through said slot and (2) a predetermined distance along said slot.

4,064,872

TEMPERATURE MEASURING DEVICE OF A LIQUID CRYSTAL LAMINATE

Sandor Caplan, Lawrenceville, N.J., assignor to Ashley-Butler, Inc., Somerville, N.J.

Filed Sept. 2, 1976, Ser. No. 719,730
Int. Cl.[2] A61B *6/10*; C09K *3/34*
U.S. Cl. 128—2 H **13 Claims**



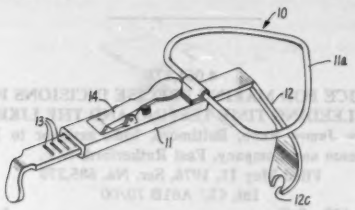
1. A temperature measuring device of high sensitivity and stability comprising a plurality of separate dots of liquid crystals which change color in a selected temperature range, sandwiched between two thin preformed, self-supporting films of heat sealable sheet material containing up to 500 mg per ream of monomeric components of solvents which are reactive with or soluble in the liquid crystal, a bottom opaque film and a top polymer film through which the color changes in the liquid crystals can be observed, the two films being sealed together in a grid pattern along narrow seal lines to form a multiplicity of separate cells, each cell containing a dot of liquid crystal.

4,064,873

TONGUE BLADE FOR MOUTH GAG

Rudolph E. Swenson, 3142 Windsor Court, Lafayette, Calif. 94549

Filed June 10, 1976, Ser. No. 694,541
Int. Cl.[2] A61B 1/00
U.S. Cl. 128—12 6 Claims



1. A series of tongue blades for use in combination with a frame and forming part of a mouth gag, said tongue blades being formed in various sizes, each blade having a handle portion and a tongue-engaging portion that extends from said handle portion at an obtuse angle between 120° and 135°, said tongue-engaging portion having a curved tip that is formed with a radius of curvature less than three-fourths inch at a distance greater than 2 inches from said handle portion whereby the handle portion and tongue-engaging portion of each tongue blade define an unobstructed obtuse angular void therebetween extending from the handle portion a distance of at least 2 inches.

4,064,874

PROTECTIVE ORTHOPEDIC DEVICE

Norman A. Valin, 4803 N. Crescent Ave., Norridge, Ill. 60656

Filed May 24, 1976, Ser. No. 689,595
Int. Cl.[2] A61F 3/00
U.S. Cl. 128—80 C 6 Claims

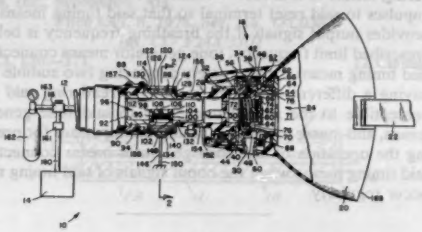
1. A compact protective orthopedic device for joints of the body, said device comprising: tubular elastic support means, said support means being adapted to substantially surround one of said joints, said support means having formed axially and peripherally therein sleeve means; and brace means being shaped and dimensioned to be insertingly accommodated by said sleeve means and said brace means being characterized as fully articulated in the normal direction of articulation of said joint, said brace means being further characterized as being rigid in a direction transverse to said normal direction, said bracing means including more than two link members, each said link member being greater longitudinally than laterally and being pivotally articulated to its adjacent partners for flexing in a common plane and each said brace means having more than one pivot for permitting said link members to pivotally articulate with respect to one another and with said joint.

4,064,875

ANTI-SUFFOCATION MEANS FOR AIRCRAFT BREATHING MASK

Robert L. Cramer; Jack E. Dunbar, and James A. Mientus, all of Davenport, Iowa, assignors to The Bendix Corporation, South Bend, Ind.

Filed July 2, 1976, Ser. No. 701,781
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—142.2 7 Claims



1. Anti-suffocation means for allowing the communication of air from a surrounding environment into a breathing system in an emergency condition when a source of breathable fluid is insufficient to meet an inhalation demand of a recipient, said anti-suffocation means comprising:

a housing having a bore therein adapted to be connected to said breathing system, said housing having an opening connecting said bore to the surrounding environment;

valve means responsive to said inhalation demand for allowing communication of air through said opening;

filter means connected to said opening, said filter having a microporous membrane means for forming a barrier through which the transmission of water is inhibited to prevent contamination of the breathing system by any water present in the surrounding environment during the operation of said valve means by said inhalation demand;

clip means attached to said housing for sealing said opening from the surrounding environment prior to said emergency condition; and

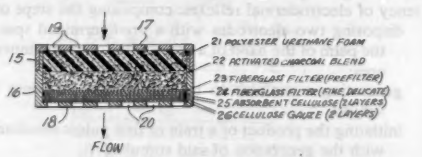
means for removing said clip means from the housing when an emergency condition occurs to allow said anti-suffocation means to operate should the recipient present a predetermined inhalation demand on said breathing system.

4,064,876

AIR-POLLUTION FILTER AND FACE MASK

Charles L. Mulchi, New Carrolton, Md., assignor to Stanley I. Wolf, Rockville, Md., a part interest

Filed Jan. 30, 1976, Ser. No. 653,717
Int. Cl.[2] A62B 7/10
U.S. Cl. 128—146.6 49 Claims



1. A filter having a plurality of component elements which, in combination, provide means for passing a gas stream therethrough at a flow rate which, per circular section of about 5 centimeters in diameter, is in the range of from 50 ± 20 liters per minute at a pressure drop of at most about 6.0 centimeters of water, the elements comprising, in sequence:

i. porous compressible means to filter contaminated gas;

ii. particulate activated charcoal means;

iii. low-resistant prefilter means to supplement physical filtration provided by (i);

iv. low-resistant filter means for filtering particulate matter as small as 0.3 micron in diameter;

v. absorbent means to trap moisture and to protect (iii) and (iv) from mechanical damage; and

vi. means to support and protect preceding elements;

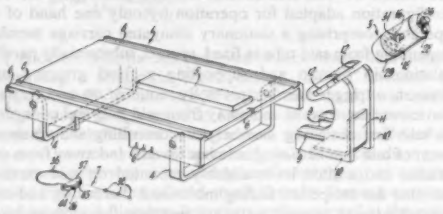
the porous compressible filter means providing means for removal of large dust particles, pollen grains, other particulate matter and aerosol droplets from the gas stream; the particulate activated carbon means providing means for removal of irritating gases from the gas stream; each element being in direct contact with adjacent elements, exerting a positive pressure against such adjacent elements to maintain them in position and having its designated function under such pressure.

4,064,877

SURGICAL TABLE WITH ANESTHETIC DISPENSING MEANS

George S. Moscowitz, Crane Road, Carmel, N.Y. 10512; John F. Rosen, and Sarah Hiatt, both of Baldwin Place Road, Mahopac, N.Y. 10541

Filed Aug. 30, 1976, Ser. No. 718,788
Int. Cl.[2] A61M *17/00*
U.S. Cl. 128—188 14 Claims



1. An anesthetic dispenser comprising a body of generally cylindrical shape and having two ends, a top on one of said ends, a barrier intermediate said ends and dividing said dispenser into a receiving chamber and a dispensing section,

valve means adapted to control the flow of said anesthetic from said receiving chamber to said dispensing section comprising a generally cylindrical opening in said barrier, a stem in said opening, said stem having a wide portion and a narrow portion, said wide portion being at least of substantially the same size as said opening and said narrow portion being substantially smaller than said opening, means for moving said stem axially of said opening into a first position and a second position, said wide portion blocking said opening when said stem is in said first position and apart from said opening when said stem is in said second position, whereby anesthetic is permitted to flow from said chamber into said section when said stem is in said second position,

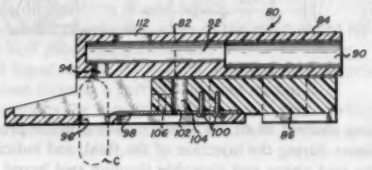
the end of said section remote from said barrier being perforated to permit said anesthetic vapor to pass therethrough, said top including an opening having a sealable filling means therein for introduction of said anesthetic into said receiving chamber, diametrically opposed support means extending radially of said body, a stand comprising two substantially parallel, vertical side portions, said side portions being spaced apart horizontally and connected by a web extending therebetween adjacent the bottom end of said stand, a dispenser slot in each side portion adjacent the upper end of said stand, said slots being complementary to said support means, said support means slidably located in said dispenser slots whereby said dispenser is suspended from said stand.

4,064,878

INHALATION DEVICE

Ingemar H. Lundquist, Oakland, Calif., assignor to Syntex Puerto Rico, Inc., Humacao, Panama

Division of Ser. No. 586,771, June 13, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,666
Int. Cl.[2] A61M *15/08*
U.S. Cl. 128—206 5 Claims



1. An inhalation device for dispensing a powdered medicament from a medicament-holding container comprising

an elongate housing having a passageway for the movement of air therethrough, one end of said housing being an output end adapted for insertion into the mouth or nasal passages of a user thereof, said passageway terminating in an emptying chamber adjacent the output end of said housing, said passageway having an inlet stream of said emptying chamber;

a guide channel on said elongate housing, means for holding a top portion of a closed, powdered-medicament holding container within said guide channel, said guide channel supporting means to open the container;

said container opening means comprising a slideable member slideably mounted within said guide channel, said slideable member having a cutting blade positioned adjacent said holding means whereby a top portion of the container is severed as said blade is moved from a first, retracted position through said container in said holding means to a second, container-severed position;

a first communication means comprising at least one first passageway extending through said slideable member for placing the interior of the severed container in communication with the atmosphere surrounding said inhalation device when said slideable member is in the second position; and

second communication means comprising a second passageway extending through said slideable member for placing the interior of the severed container in communication with said passageway through said elongate housing via said inlet when said opening means is in the second position whereupon, during inhalation, air drawn through said first communication means causes the powdered medicament to be expelled from the container through said second communication means, said inlet, said passageway and said emptying chamber into the nose, throat or lungs of a user thereof.

4,064,879

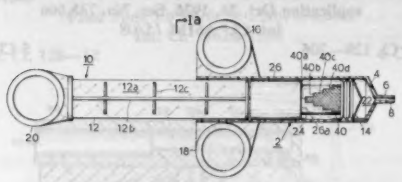
PRESSURE-INDICATING SYRINGE

Saul Leibinsohn, Rishon Lezion, Israel, assignor to Metatech Corporation, Northbrook, Ill.

Filed Apr. 6, 1976, Ser. No. 674,283
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—215 19 Claims

1. A syringe comprising: a barrel having an apertured wall at one end and open at its opposite end; a plunger assembly movably received within the open end of the barrel; said plunger assembly including a shaft at its outer end, and a piston at its inner end defining a compartment with the barrel apertured wall for receiving a fluid to be injected through the aperture thereof; finger-gripping elements on the barrel and on the plunger shaft enabling the latter and the piston to be manually

moved towards the apertured wall of the barrel for pressure-injecting fluid therethrough; an elastic connection between the finger-gripping element of the plunger shaft and the piston enabling the piston to be displaced relative to the shaft finger-



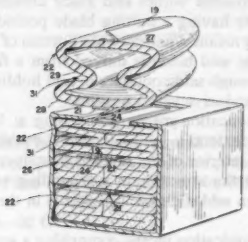
gripping element an amount corresponding to the pressure on the piston during the injection of the fluid, and indicium carried by said piston and viewable through said barrel thereby providing a viewable indication of the injection pressure.

4,064,880

SANITARY TUBULAR NAPKIN FOR MALES

Dexter J. Logan, 1215 W. Farlington St., W. Covina, Calif. 91790

Filed Sept. 7, 1976, Ser. No. 721,099
Int. Cl.² A61F 5/42
U.S. Cl. 128—294 **1 Claim**



1. A tubular sanitary napkin of the type described, comprising:

a removal-tab positioned centrally of said napkin;

said napkin being closed at one end, and being open at the other end thereof, and having an upper portion and a lower portion, wherein said removal-tab is affixed to said upper portion of said napkin;

a retaining element fixedly positioned centrally on said lower portion of said napkin;

a second napkin having an upper and a lower portion, including a removal-tab affixed to said upper portion thereof and joined to said retaining element of said lower portion of said first napkin;

joining means for joining together said tabs;

a plurality of similar napkins having their removal-tabs joined to the retaining elements of preceding napkins, and having their retaining elements joined to the removal-tabs of subsequent napkins — said plurality of napkins forming a tandem set of napkins, whereby said tandem set of napkins may be compacted to a flat pack;

and wherein said napkins have an upper surface, a lower surface, and two side surfaces;

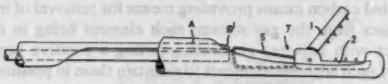
each of said side surfaces having a longitudinal re-entrant fold therein.

4,064,881

SURGICAL CLIP APPLICATOR

Hayden Gwyn Meredith, Kingsbury, England, assignor to Rocket of London Limited, Watford, England

Filed June 1, 1976, Ser. No. 691,324
Claims priority, application United Kingdom, June 6, 1975, 24374/75
Int. Cl.² A61B 17/10, 17/12
U.S. Cl. 128—325 **5 Claims**



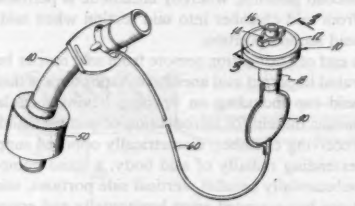
1. In a hand operated surgical clip applicator for positioning and actuating a jaw-like surgical clip and clamping an associated spring thereon comprising an elongated positioning tube having a cradle at one end thereof for holding said clip and spring and independent actuating and clamping controls at the opposite end thereof, a first actuating member slidably mounted within said tube for actuating said jaw-like clip and an independent second actuating member slidably mounted within said tube for clamping said associated spring on said clip, said independent actuating and clamping controls controlling slidable movement of said actuating members, the improvement wherein said controls are of a pistol grip assembly configuration adapted for operation by only one hand of an operator comprising a stationary elongated carriage member depending from said tube in fixed, spaced, substantially parallel relationship thereto and supporting a fixed gripping butt thereon, a trigger member pivotally mounted on said carriage for movement toward and away from said butt and connected to said first actuating member for controlling sliding movement of said first actuating member toward and away from said cradle, and a slide lever slidably mounted on said carriage member for reciprocal sliding movement therealong and connected to said second actuating member for independently slidably moving said second member along said tube as said slide lever slides along said carriage member, said slide lever including a laterally extending actuating portion adapted for actuation by the same hand of the operator gripping said butt and trigger members.

4,064,882

TRACHEOSTOMY TUBE WITH PRESSURE RELIEF VALVE

George Michael Johnson, La Palma; Kenneth Keith Krueger, Tustin, and Todor Pavlov, Laguna Niguel, all of Calif., assignors to Shiley Laboratories, Inc., Irvine, Calif.

Filed Aug. 25, 1975, Ser. No. 607,231
Int. Cl.² A61M 25/00
U.S. Cl. 128—351 **13 Claims**



1. In a tracheostomy tube system of the type which includes a tracheostomy tube having an outer end and an inner end adapted to be inserted into the trachea of the user, an inflatable cuff surrounding the tube, and means for inflating the cuff, the improvement wherein the means for inflating the cuff comprises, in combination:

a fluid inlet adapted to receive the tip of means for supplying fluid under pressure, a fluid outlet and valve means between said fluid inlet and said fluid outlet;

means for passing fluid under pressure from the fluid inlet through said valve means and then through said fluid outlet connected to the inflatable cuff so that the valve means is interposed between the inlet and the cuff; and

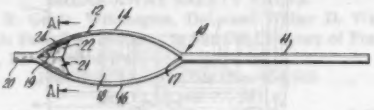
said valve means including vent valving means in fluid communication with said fluid inlet for venting fluid during the inflation of the cuff only when the pressure in the fluid at the inlet reaches a predetermined pressure value to thereby prevent application of pressure greater than said value to the outlet of said valve means and thereby to the cuff.

4,064,883

DENTAL FLOSS THREADER WITH LOCKING MEANS

George Ronald Oldham, Lakewood, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed May 3, 1976, Ser. No. 682,282
Int. Cl.[2] A61C *15/00*
U.S. Cl. 132—93 **3 Claims**



1. A dental floss threader adapted to lock dental floss thereto comprising a semi-rigid shank having smooth surfaces; an eyelet integrally joined at one end of said shank, said eyelet being formed by a division at one end of said shank into two filaments, each filament having a cross sectional area less than the cross sectional area of said shank, said filaments diverging in arcuate opposing relationship and converging at a point spaced from said end of said shank thereby forming an elongated loop, said filaments being integrally merged at the point of convergence to form a short, unitary stem at that end of said eyelet; and locking means integrally joined to said eyelet and responsive to insertion of dental floss therein for locking said dental floss to said threader, said locking means and said eyelet being formed from plastic material, the locking means consisting of a film of plastic material extending from said point of convergence of the filaments a short distance into the plan of the eyelet so that the film connects the converging filaments, said film having a thickness less than the thickness of said filaments, said film being separable between said converging filaments so that when dental floss is inserted into said eyelet, and is urged against said film, said film separates to form a slot therein whereby said slot and separated film portions cooperate to lock said floss in place to prevent slippage of said floss during use.

4,064,884

METHOD AND DEVICE FOR STRIPPING OFF, WASHING AND DRYING SURFACE TREATED OBJECTS IN LONG LENGTHS SUCH AS STRIP, WIRE, ROD, SECTIONS OR FIBRES

Hans Eskil Asp, Hammaro, Sweden, assignor to C. J. Wennberg AB, Sweden

Filed Mar. 25, 1976, Ser. No. 670,432
Claims priority, application Sweden, Mar. 25, 1975, 7503464
Int. Cl.[2] B08B *1/02*
U.S. Cl. 134—15 **4 Claims**

1. A method for cleaning an elongated object which has been surface-treated at a station with a fluid medium, comprising:

a. continually moving the object in a direction along its length through a subsequent first station;

b. continually spraying the entire periphery of the object as it passes through said first station with a liquid of substantially the same kind as said fluid medium, all the spray being directed counter to said direction of movement, and recirculating the sprayed liquid;

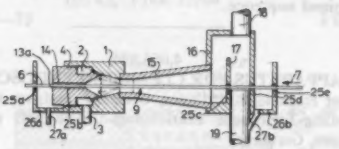
c. thereafter, at least partially drying the object with air moving in said first station in an opposite direction, and separating the used air from the liquid about to be recirculated;

d. thereafter repeating steps (b) and (c) in at least one subsequent second station, each time using and recirculating a more diluted form of said liquid;

e. selectively transferring some of the recirculated liquid to the next preceding station; and

f. said liquid, in the last station, substantially comprising a solvent forming a part of said fluid medium.

4. Apparatus for cleaning an elongated object which has been surface-treated at a station with a fluid medium, comprising:



a. a fluid-inlet assembly having a multiple jet nozzle upstream of a venturi, said inlet assembly having a passage extending therethrough with a cross-section larger than that of the object for enabling the intake of drying gas as the object is passed therethrough in an object-feeding direction, all the jets of said nozzle being directed for guiding liquid through air into impingment with the object at an angle having a vector opposite to said feeding direction;

b. means for supplying liquid to said jet nozzle of substantially the same type as said fluid medium; and

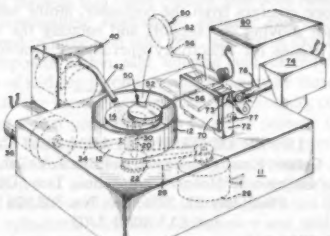
c. a discharge assembly connected to said fluid inlet assembly in which moist air and liquid are separated, having an outlet from which moist air is vented to the atmosphere, having a separate outlet through which liquid injected from said jet nozzle is removed, and through which assembly the object passes to said passage.

4,064,885

APPARATUS FOR CLEANING WORKPIECES BY ULTRASONIC ENERGY

Jean G. M. Dussault, Naugatuck; Robert A. Geckle, Newtown, and William L. Puskas, Trumbull, all of Conn., assignors to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed Oct. 26, 1976, Ser. No. 735,601
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—58 R **13 Claims**



1. Apparatus for cleaning a workpiece, such as a semiconductor wafer, comprising:

a rotatable support including means for holding a workpiece on said support;

means coupled to said support for rotating said support to cause a workpiece disposed on said support to undergo rotation;

means for flooding the exposed side of the workpiece with a flowing film of cleaning solvent;

mounting means disposed for supporting electroacoustic transducer means opposite said exposed side;

electroacoustic transducer means coupled to said mounting means for providing, when said transducer means is energized, ultrasonic energy to said flowing film of solvent and causing cavitation therein for cleaning said exposed workpiece side;

electrical generating means coupled for energizing said transducer means, and

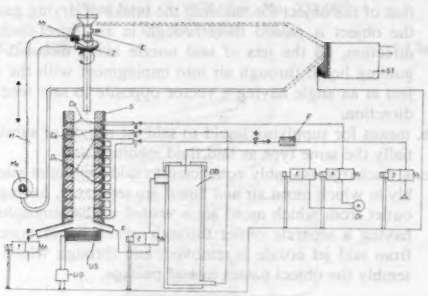
control means coupled to said means for rotating, said means for flooding and said electrical generating means for providing operation of said respective means in predetermined sequence.

4,064,886

APPARATUS FOR CLEANSING ENDOSCOPES

Helmut Heckele, Knittlingen, Germany, assignor to Riwoplan Medizin-Technische Einrichtungs-Gesellschaft mbH, Knittlingen, Germany

Filed Nov. 17, 1976, Ser. No. 742,579
Claims priority, application Germany, Nov. 20, 1975, 2552011
Int. Cl.[2] B08B *3/02, 3/12*
U.S. Cl. 134—95 **4 Claims**



1. Apparatus for cleaning endoscopes comprising a container having a first set of nozzles connected to a source of water, a second set of nozzles connected to a source of disinfecting liquid, and a third set of nozzles connected to a source of compressed air, control valves respectively interposed between each source and the related nozzles, a rotatable mount positioned above the container and adapted to suspend the endoscope, a vertically movable support supporting the mount so that on downward movement the suspended endoscope is submerged in whilst on subsequent upward movement the endoscope emerges from the container, motor means respectively for moving the support and rotating the mount, and control means for selectively operating the motors and the valves.

4,064,887

UPPER LEVEL WASH ARM SYSTEM

Paul B. Geiger; Ernst Grunewald, and Ben J. Vallor, all of Troy, Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed July 27, 1976, Ser. No. 708,926
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—144 **10 Claims**

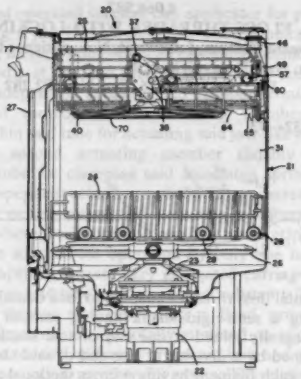
1. In an upper level wash arm system for a dishwashing machine having a tank defining a cleansing chamber, a fluid recirculating pump having an inlet and an outlet, lower and upper racks supportable within the tank and movable horizontally between washing and extended positions, at least one fluid spray member, and vertical adjustment means mounting the upper rack for selective vertical adjustment of the washing position thereof within the dishwasher tank, the improvement comprising:

a. means mounting the fluid spray member on the upper rack for vertical movement therewith in response to vertical adjustment of the rack,

b. a first coupling member supported in the dishwasher at a relatively fixed height in the tank,

c. a conduit for conducting fluid from the pump outlet to said first coupling member,

d. a second coupling member for engaging the first coupling member for receiving fluid therefrom when the upper rack is in any of the selected washing positions thereof within the dishwasher tank,



e. means mounting said second coupling member on the upper rack at substantially a constant vertical height when the rack is in any of the selected washing positions within the dishwasher tank for enabling coupling to said fixed height first coupling member independently of the adjusted vertical position of the rack, and

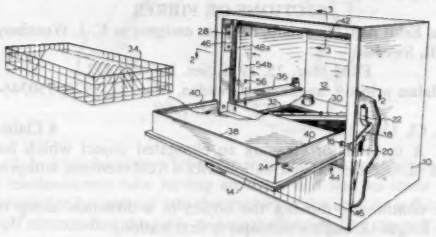
f. means for conducting fluid from said second coupling member to the fluid spray member and for compensating for possible differences in the relative vertical positions between said second coupling member and said spray member when the rack is in a washing position within the tank.

4,064,888

VENT STRUCTURE FOR DISHWASHERS

Howard Diebel, St. Catharines, Canada, assignor to Moyer Diebel Limited, Jordan Station, Canada

Filed Feb. 7, 1977, Ser. No. 766,359
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—182 **6 Claims**



1. A dishwasher of the batch type comprising a body providing an enclosure,

water spray means mounted in the enclosure for spraying water on to dishes placed therein,

a sump within the enclosure receiving liquid that drains thereto,

a door for the enclosure pivotably mounted to the body and movable between open and closed positions,

seal means mounted around the said body opening and engaged by the door in closed position for sealing the junction befween the body and the door,

vent means comprising a vent structure mounted to the body to one side of the door, the said vent structure providing at least one labyrinth vent passage connecting the body interior and the ambient atmosphere through which gas and vapour from the body interior can pass with change of direction of flow so as to promote contact thereof with the walls of the vent passage, and

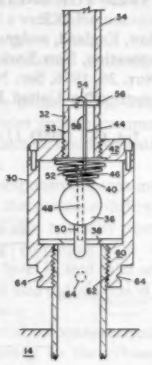
the vent structure also providing at least one vertical drain passage connecting the vent passage and the sump and having passage walls in common with the vent passage whereby moisture condensing on the said walls drains down to the said sump.

4,064,889

BREAK-AWAY SAFETY VALVE

Harold R. Gayle, Wilmington, Del., and Walter D. Wagner, Chadds Ford, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Feb. 17, 1976, Ser. No. 654,503
Int. Cl.² F16K *17/36*
U.S. Cl. 137—68 R **2 Claims**



1. A break-away valve system designed to automatically close in the event of damage to the valve and comprising:

a. a valve housing and a break-away section separated from said valve housing having a weakened portion which consists of a groove around the circumference of the break-away section whereby substantial force on the valve system results in separation of the break-away section from the housing

b. said break-away section having a retainer means;

c. a substantially circular valve seat within said valve housing;

d. a valve element in said valve housing having a substantailly spherically shaped surface which is adapted to close against said valve seat to close the valve, and a guide element, extending through the valve element and loosely into the valve seat so that the guide element does not normally contact the valve seat when the valve is open, to guide the spherically shaped surface into a seating relationship against said valve seat while the valve is closing;

e. spring means for biasing said valve element towards said valve seat to close the valve; and

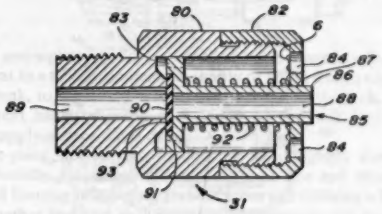
f. pin means coupled to said retainer means in said break-away section and extending through a general plane of the weakened groove and holding said valve element away from said valve seat against the bias of said spring means which places said pin means in tension, said pin means being adapted to sever in the event said valve system severs along the weakened portion, whereby the valve element is biased against the valve seat and closes the valve.

4,064,890

PRESSURE REGULATOR AND SAFETY RELIEF VALVE

Jr. Collins, Fort Washington, and James J. Kokinda, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 589,442, June 23, 1975, abandoned, which is a division of Ser. No. 437,896, Jan. 30, 1974, Pat. No. 3,911,948. This application Sept. 20, 1976, Ser. No. 724,503
Int. Cl.² F16K *13/04*
U.S. Cl. 137—73 **1 Claim**



1. In an oxygen pressure regulator for maintaining constant lower pressure of oxygen gas delivered from a relatively high pressure source of the type including a casing having an internal flexible diaphragm dividing said casing into two major chambers, one chamber being vented to the atmosphere and containing adjustable resilient means for exerting a predetermined constant pressure against the diaphragm, and the other chamber being a gas chamber divided into two subchambers, a first inlet sub-chamber for receiving said high pressure gas and a second outlet sub-chamber for accumulating and delivering said gas at a lower pressure to an outlet means provided with valve-controlled inlet means connectable between said first and second sub-chambers to regulate the pressure of said gas in said outlet sub-chamber, the improvement comprising:

a pressure relief valve in communication with said outlet sub-chamber, comprising in combination;

a generally cylindrical housing having an inlet port and an outlet port said outlet port closed by a cap threadably engaging said housing, said cap having a plurality of apertures defining a flow path from said housing to the atmosphere;

a valve closure member in the form of a stepped cylinder having a T-shaped cross-section with a generally cylindrical bore through said valve closure, said bore closed by a single combustible elastomeric element and also being positioned to close said inlet port, said valve closure slidably disposed within said housing and extending outwardly of said cap through a suitable aperture therein said valve closure member exterior and said housing coacting to effect a first passage means to allow passage of fluid from said inlet port to said outlet port when pressure in said outlet sub-chamber exceeds a given value;

a spring disposed around the longer of the cylindrical sections of said valve closure and extending between the base of said cylindrical section of said closure and said cap to urge said valve closure member toward said inlet port to prevent passage of gas until the gas pressure at the inlet exceeds a preset limit said cap movable to adjust the tension on such spring to adjust the pressure at which said valve will open;

whereby if combustion occurs inside said regulator, said

combustible element will be consumed regardless of the pressure on said valve closure member, thus venting said combustion from said regulator to prevent cataclysmic failure of said regulator.

4,064,891

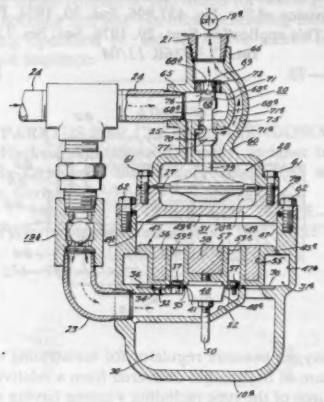
PLURAL FLUID PROPORTIONING APPARATUS

H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Continuation-in-part of Ser. No. 477,156, June 6, 1974, abandoned. This application Dec. 24, 1975, Ser. No. 644,063

Int. Cl.[2] G05D *11/00*

U.S. Cl. 137—98 **29 Claims**



9. A valve for mixing a primary fluid with a secondary fluid in a predetermined proportion comprising: a body having a first inlet for primary fluid and a second inlet for secondary fluid and an outlet, separate port means providing fluid communication between said first and second inlets and said outlet, a valving member extending across said first and second port means and mounted in a chamber for vertical movement in response to fluid flow through said port means, means carried by said valving member to bias said member into a lower limit position normally closing fluid flow through said port means, means slidably mounting said valving member for said vertical movement in said chamber, first bypass port means in said valving member establishing fluid communication between said first inlet and said outlet for said primary fluid and second bypass port means establishing fluid communication between said second inlet and said outlet when said valving means is in its lower closed position, said first bypass means being of a greater cross sectional area than said second bypass port means and said first and second bypass ports being of a predetermined relative cross sectional area to provide flow therethrough in relation to the predetermined ratio of said primary and secondary fluids.

4,064,892

POLLUTION CONTROL DEVICE

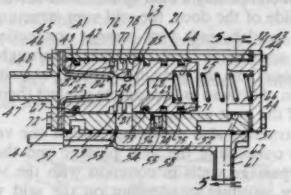
Frank Brisko, Box 38, Ojibwa, Wis. 54862

Division of Ser. No. 470,262, May 15, 1974, Pat. No. 3,951,115. This application Jan. 8, 1976, Ser. No. 647,627

Int. Cl.[2] F16K *11/07*

U.S. Cl. 137—110 **2 Claims**

1. A valve for controlling the flow of crankcase vacuum gases to an engine induction system and for providing a preselected control pressure to a pollution control device comprising a valve housing defining a valve bore, a first port opening into said bore at one end thereof and adapted to communicate with a discharge of a crankcase vacuum system, a second port communicating with said bore at the opposite end thereof and adapted to be positioned in fluid communication with the engine induction system, a valve spool slidably supported in said bore, a third port formed in said housing communicating with said bore between said first and said second ports, means providing communication between said third port and said second port for permitting the flow of gases from said first port through said third port to said second port, means on said valve spool and said housing for varying the degree of fluid communication between said first and said third ports in relation to the position of said valve spool in said valve bore, and a fourth port opening into said valve bore at a point spaced from said valve spool when said valve spool is in one of its extreme positions and being adapted to be closed by said valve spool when said valve spool moves from said one extreme position, said fourth port being adapted to provide a control pressure signal to a pollution control component of the associated engine.



4,064,893

DISCHARGE SYSTEM FOR BALLAST TANK OR THE LIKE

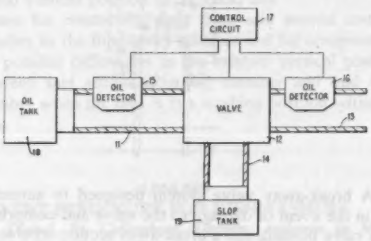
Gillies D. Pitt, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,059

Claims priority, application United Kingdom, Dec. 4, 1975, 49822/75

Int. Cl.[2] G05D *11/00*

U.S. Cl. 137—115 **1 Claim**



1. A discharge system for a tank containing an oil and water mixture, said system comprising: an oil tank; a valve having an inlet and first and second outlets; a first conduit connected between said oil tank and said valve inlet; a first detector having an output lead, said first detector being fixed in said first conduit and constructed to produce a course output signal on said output lead thereof in accordance with the amount of oil present within said first conduit; a control circuit having a first lead connected from said first detector output lead, and a second lead connected to said valve; a slop tank; and a second conduit connected from said first valve outlet to said slop tank, said control circuit causing the fluid in said first conduit to pass through said first valve outlet when the oil within said first conduit is above a first predetermined threshold level wherein a third conduit is connected from said second valve outlet, a second detector having an output lead connected to said control circuit, said second detector being mounted within said third conduit to produce a fine output signal on said output

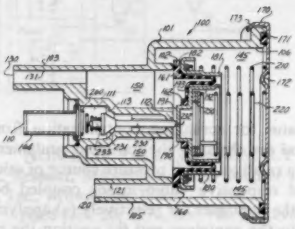
lead thereof in accordance with the amount of oil present within said third conduit, said control circuit controlling the rate of discharge through said third conduit, said second detector being more sensitive than said first detector.

4,064,894

VACUUM REDUCER VALVE

George C. Ludwig, Troy, Mich., assignor to The Bendix Corporation, South Bend, Ind.

Continuation of Ser. No. 520,325, Nov. 4, 1974, abandoned. This application May 10, 1976, Ser. No. 684,597
Int. Cl.[2] G05D *11/00*; F02P *5/04*
U.S. Cl. 137—116.5 4 Claims



1. In a vacuum reducer valve:

a housing defining a chamber therewithin and having an inlet, an outlet, and a vent communciating with said chamber;

normally open valve means controlling communication through said vent;

normally closed valve means within said chamber dividing the latter into an inlet section communicating with said inlet and an outlet section communicating with said outlet and with said vent;

pressure differential responsive means including a first portion responsive to the pressure differential between said sections for closing said normally open valve means and thereby preventing communication through said vent when the pressure level in said inlet section drops below the pressure level in said outlet section by a first predetermined amount;

said pressure differential responsive means including a second portion responsive to the pressure differential between said sections for opening said normally closed valve means and thereby communicating said inlet and outlet sections when the pressure level in said inlet section drops below the pressure level in said outlet section by a second predetermined amount, said second predetermined amount being greater than said first predetermined amount whereby said normally open valve means is closed to prevent communication through said vent before said normally closed valve means is opened;

said normally open valve means including a valve seating area associated with said vent, a valve poppet associated with said seating area and having an actuating member extending into said chamber and spring means yieldably urging said valve poppet toward said valve seating area;

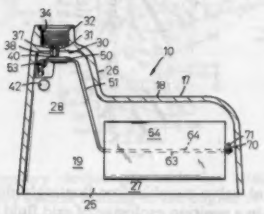
said first portion of said pressure differential responsive means including a retainer slidable in said chamber and responsive to the pressure differential between said sections, and resilient means urging said retainer toward said actuating member, said resilient means being stronger than said spring means so that said retainer acting through said actuating member urges the poppet away from the valve seating area when the pressure differential is less than the predetermined amount.

4,064,895

NON-SIPHONING FLOAT CONTROLLED VALVE ASSEMBLY

Arden L. Borgen, and Cleon C. Merrill, both of Webster City, Iowa, assignors to Arrow-Acme Corporation, Webster City, Iowa

Filed Aug. 12, 1976, Ser. No. 713,848
Int. Cl.[2] G05D *9/02*; F16K *31/18, 24/02*
U.S. Cl. 137—216 10 Claims



1. A non-siphoning float controlled valve assembly for attachment to a tank to control the supply of liquid from a source to the tank, to regulate the level of the liquid in the tank, and to prevent back-siphoning of liquid from the tank into the liquid supply source comprising:

a one-piece hollow housing having an integrally formed upwardly extending hollow neck near one end thereof, said housing being open at the bottom and defining a float chamber and said neck defining a fill passage and having an upper end;

a liquid fill inlet opening near said upper end of said neck for communicating between said liquid supply source and said fill passage;

a valve seat surrounding said liquid fill inlet opening;

at least one anti-siphon hole extending through said neck below said liquid fill inlet opening;

a float support lever having an upper end and a lower end and extending between said fill passage and said float chamber;

means for pivotally connecting said upper end of said lever to said neck in said fill passage, said means for pivotally connecting said upper end of said lever to said neck comprising at least one pivot pin hole extending through said neck, at least one pivot pin hole through said lever near said upper end thereof, and a pin extending through both said pivot pin holes;

a float disposed in said float chamber and connected to said lower end of said float lever; and

a resilient member connected to said support lever for cooperation with said valve seat to open and close said liquid fill inlet opening in response to pivotal movement of said float support lever and said float.

4,064,896

VACUUM BREAKERS

John Trenary, Fort Collins, Colo., assignor to Teledyne Industries, Inc., Fort Collins, Colo.

Filed Jan. 19, 1976, Ser. No. 650,118
Int. Cl.[2] F16K *15/04*
U.S. Cl. 137—218 2 Claims

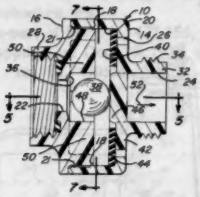
1. A vacuum breaker comprising:

a first tubular housing portion having an outwardly facing inlet coupling that opens into an interior bore in which is defined an inwardly-facing first valve seat;

a second tubular housing portion having an outlet coupling facing outwardly and opposite said inlet coupling, said first and second portions being joined together to define a fluid flow path between said inlet and outlet couplings and an interior chamber surrounding said fluid flow path with an interior wall of said chamber defining a second valve seat facing inwardly and toward said first valve seat;

means defining at least one opening from said chamber through said second valve seat to the exterior of said second portion;

a first valve member free-floatingly disposed in said bore and sealingly engageable with said first valve seat upon the flow of fluid toward said inlet coupling from either of said outlet coupling and said opening;



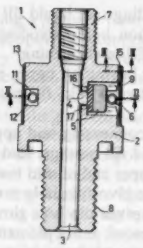
and a second valve member free-floatingly disposed in said chamber in a position exclusive of said fluid flow path and sealingly engageable with said second valve seat in response to the flow of fluid from said inlet coupling to said outlet coupling.

4,064,897

TIRE FILLER VALVE ARRANGEMENT

Rudiger Weber, Neureut, Germany, assignor to Firma Dr. Ing. h.c.F. Porsche AG, Germany

Filed Dec. 12, 1975, Ser. No. 640,180
Claims priority, application Germany, Dec. 12, 1974, 2458729
Int. Cl.² F16K *15/20*
U.S. Cl. 137—224 **8 Claims**



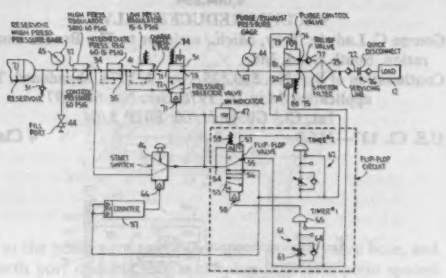
1. A valve arrangement for filling a tire with air, the arrangement comprising: a valve body, a first passage means for communicating said first passage means with the environment, a valve means including a valve plunger disposed at said second passage means for selectively controlling the communication between said first passage means and the environment, said valve means having a first closed position and a second open position, at least one cylindrical helical spring of circular cross-section disposed about a periphery of said valve body and engaging said valve plunger for normally biasing said valve plunger into said closed position, an annular recess means provided about the periphery of said valve body for receiving said cylindrical helical spring, said cylindrical helical spring having a spring characteristic corresponding to a desired inflation value of a vehicle tire whereby, upon the air in a vehicle tire exceeding the desired inflation valve, said valve plunger is displaced to said open position against the bias of said cylindrical helical spring to communicate said first passage means with the environment thereby expelling excess air from a vehicle tire, and wherein at least one channel means is provided along at least a portion of the periphery of said valve body extending in an axial direction of the valve body, said channel means communicating with said second passage means whereby the excess air is expelled from a tire through said channel means.

4,064,898

PURGE AND CHARGE EQUIPMENT

Virgil F. Petersen, Cincinnati, Ohio, and Willard L. Skirvin, Rochester, Mich., assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Mar. 24, 1976, Ser. No. 670,022
Int. Cl.² B08B *5/00*
U.S. Cl. 137—240 **18 Claims**



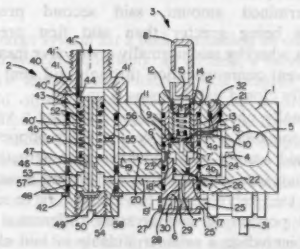
1. Apparatus for scrubbing contamination from a sealed container and for charging the scrubbed container with a gas comprising a relatively high pressure source of said gas, pneumatic signal responsive valve means coupled between the source and the container for selectively (a) applying gas from the source to the container and (b) venting the container in response to a pneumatic signal, pneumatic logic means responsive to the source of the gas for sequentially deriving a preselected number of pneumatic signals that control applying of the gas and venting the container, said valve means being constructed so as to sequentially supply and exhaust a flow of gas from the source into and out of the chamber in response to each of said signals to thereby scrub contamination in the container, said logic means further including means for deriving a further pneumatic signal in response to an indication that a scrubbing cycle of the container has been completed, and means responsive to the further pneumatic signal for activating the valve means to apply charging gas at a predetermined pressure from the source to the container.

4,064,899

CONTROL AND SIGNAL ARRANGEMENT FOR RESPIRATORS

Klaus Dieter Lehmann, Cologne-Deutz, Germany, assignor to Kurt Matter GmbH K.G., Germany

Filed Nov. 13, 1975, Ser. No. 631,651
Claims priority, application Germany, Nov. 13, 1974, 2453734
Int. Cl.² F16K *37/00*
U.S. Cl. 137—269 **53 Claims**



1. A control arrangement for controlling a compressed fluid respirator in which a compressed fluid is fed from a compressed fluid reservoir to a dosing valve, the arrangement comprising: a pressure reducing means for reducing a fluid inlet pressure from the compressed fluid reservoir to an inter-

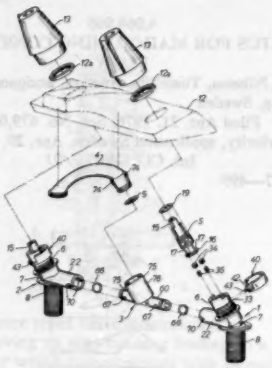
mediate or back pressure, a fluid pressure supply block means, receiving means provided in said supply block means for receiving said pressure reducing means including at least one first bore extending through said supply block means, said pressure reducing means being fashioned as an independent module and including a housing means inserted in said at least one first bore, said receiving means and said pressure reducing means having a substantially identical cross-sectional configuration, fastening means for selectively fastening said pressure reducing means in said supply block means, said pressure reducing means including at least one radial bore terminating in a continuous groove extending around the housing means for communicating said pressure reducing means with said supply block means, and wherein said supply block means includes at least one supply bore communicating with said continuous groove.

4,064,900

NON-RISE FAUCET ASSEMBLY

William C. Schmitt, Milwaukee, Wis., assignor to Milwaukee Faucets, Inc., Milwaukee, Wis.

Filed Oct. 26, 1976, Ser. No. 735,595
Int. Cl.² F16K *11/20*
U.S. Cl. 137—315 **6 Claims**



1. A non-rise faucet comprising a shank having a lower end through which fluid is introduced and also having an upper end including a stem chamber and communicable with said lower end for the reception of fluid therefrom, an elongated and removable stem slideable into said chamber and having a lower end forming a movable valve in said chamber to permit regulated flow of water through said faucet upon rotation of said stem in said chamber, said upper end of said shank having a slot arranged generally transverse to said elongated stem, said stem having a radial shoulder adjacent its upper end for alignment with said transverse slot, and a removable retainer clip having a portion slideably engaged in said transverse slot, said portion having a recess for embracing and engaging the upper end of said stem when said clip is inserted in said transverse slot, said clip also having a bevelled edge at one side thereof for engagement with said shoulder when said clip is initially inserted in said slot, whereby further engagement of said clip into said slot causes said shoulder and stem to be pushed downwardly in said shank for operative engagement of said valve, said clip when inserted in said transverse slot preventing longitudinal movement of said elongated stem.

4,064,901

GASOLINE SUPPLY ACCESSORY

David P. Bailey, Milton, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,123
Int. Cl.² B60R *27/00*
U.S. Cl. 137—351 **4 Claims**

1. An accessory device adaptable for attachment to the gasoline supply system leading to the engine of a vehicle so as to serve as a source of gasoline to a tank exterior of the attached vehicle, consisting of

a flexible hose fitted by a tee connector to the gasoline line in a vehicle, said tee connector mounted in the tubing of the vehicle joining the fuel pump to the carburetor, and

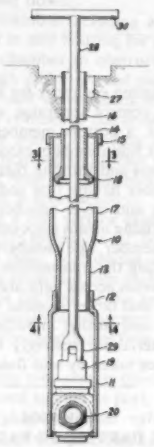
valve means to regulate the flow of gasoline through said hose.

4,064,902

CURB BOX

John Gordon Swenson, 1210 Beaver Drive, Erie, Pa. 16509

Filed June 30, 1976, Ser. No. 701,288
Int. Cl.² F16L *5/00*
U.S. Cl. 137—370 **2 Claims**



1. A curb box saddle comprising,

a hollow, cylindrical, open-bottomed base housing made of unitary cast material and adapted to rest on a water main having a valve,

the lower end of said base housing being adapted to receive said valve,

pipe means on the upper end of said base housing formed into an oval shape having a major diameter and a minor diameter, means securing said pipe means to said base housing

a stand pipe slidably received in said pipe means,

said stand pipe having a diameter approximately equal to the said minor diameter of said pipe means,

said stand pipe having outwardly extending ears on its lower

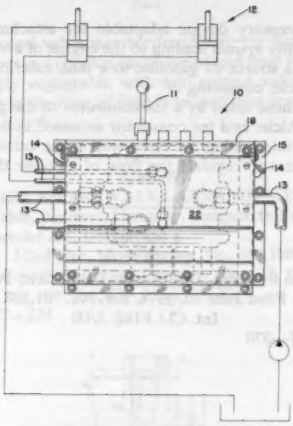
end extending outwardly a distance approximately equal to said major diameter,
and a cap separate supported on the upper end of said pipe means,
said cap having a downwardly extending flange receiving the upper end of said pipe means,
a central hole in said cap slidably receiving said upper stand pipe.

4,064,903

NOISE ENCLOSURE FOR HYDRAULIC VALVE

John E. Soulsby, Mentor, and Richard J. Malecha, Cleveland, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed July 6, 1976, Ser. No. 702,546
Int. Cl.[2] F16K *51/00*
U.S. Cl. 137—375 **4 Claims**



1. A noise attenuating enclosure for a valve having protruding fluid lines and control apparatus, said enclosure comprising; a top member, a bottom member, a pair of oppositely facing spaced-apart side members extending between said top and bottom members and forming therewith a box-like structure, a cover member having first and second flanges for removably attaching said cover member to said side members, sound attenuating lining means associated with each of said top member, bottom member, side members and cover member for substantially reducing the transmission of valve noise through said members, wherein access gaps are provided between said side members and said cover member for the accommodation of said fluid lines, and further including fitted plug means of sound barrier material for sealingly filling said access gaps except for the space taken by said fluid lines.

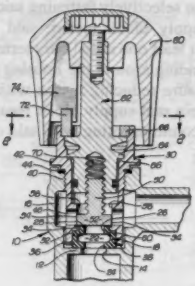
4,064,904

WASHERLESS CARTRIDGE VALVE FOR FAUCETS

Julius L. Tolnai, Los Angeles, Calif., assignor to Price Pfister Brass Mfg. Co., Pacoima, Calif.

Filed Apr. 30, 1976, Ser. No. 682,180
Int. Cl.[2] F16K *25/00*
U.S. Cl. 137—454.5 **7 Claims**

1. In a valve structure for a plumbing fixture or the like:
a. means forming a valve body having an inlet port and an outlet passage;
b. a hollow sealing member made of flexible material confined against the body and having a first opening registering with said body inlet port, said sealing member having a second opening entirely surrounded by a flexible lip capable of deflecting inwardly of the sealing member;
c. closure means having a head;
d. means guiding said closure head for movement in a path substantially parallel to the axis of said second opening to engage said lip near the said second opening so that said lip deflects upon engagement between said lip and said closure head;
e. said body outlet passage and said second sealing member opening being in communication when said closure head is away from said sealing member;



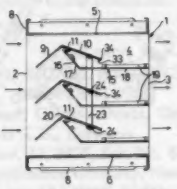
f. means independent of said sealing member for limiting movement of said closure head beyond initial engagement with said sealing member; and
g. the supply pressure inside said sealing member urging said lip into said engagement with said closure head while said lip is free of high compressive stress.

4,064,905

APPARATUS FOR MAINTAINING CONSTANT MASS FLOW

Allan Elvir Nilsson, Tomelilla, Sweden, assignor to Stifab AB, Jonkoping, Sweden

Filed Apr. 21, 1976, Ser. No. 679,058
Claims priority, application Sweden, Apr. 29, 1975, 7504969
Int. Cl.[2] G05D *7/01*
U.S. Cl. 137—499 **6 Claims**



1. An apparatus intended for placing in the path of a fluid flow, e.g. an airstream to maintain a substantially constant mass flow in the flow path downstream of the apparatus independent of pressure alterations in the flow path upstream of the apparatus, said apparatus comprising a regulator housing (1) with a fluid inlet (2) to which the flow path upstream of the apparatus is connected, a fluid outlet (3) to which the flow path downstream of the apparatus is connected and a plurality of throughput passages in the housing, extending from the inlet to the outlet, in said passage, there being arranged a plurality of movable damper elements (7) operable from outside the housing, the adjustment of which causes alteration of the throughput cross-sectional area of the passages, each damper element comprising a damper blade (7), angular in cross section, and having a substantially planar forward blade portion (9) and a substantially planar rear blade portion (10) connected thereto which forms an obtuse angle with the forward blade portion, each said damper blade being carried by and attached to a damper shaft (11) pivotally mounted in the housing and extending transversely through the passage, whereby the

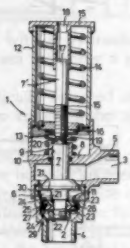
throughput cross-sectional area is determined primarily by the size of a gap (35) between each rear blade portion (10) and a first, fixed wall portion in an adjacent passage, and secondarily by an intermediate space (36) between each forward blade portion (9) and a second fixed or movable wall portion in an adjacent passage and that the damper blade position in the passages is determined by the torque equilibrium about the damper shafts resulting from the fluid forces generated by the fluid mass flow on the forward and rear blade portions, and a torque with which the damper shafts are affected by an adjustable mass body system (14) carried by and acting on a counterweight neck (13) interconnected with the damper shafts and projecting outwardly from the outside of the housing, a baffle plate (15) mounted transverse to the passage and attached to the housing for each damper blade (7), the baffle plate extending between the parallel side walls (4) of the passage, and extending with a planar, forward plate portion (17) in the flow direction from the region of the damper blade shaft (11) down to a line parallel with this shaft beneath and downstream of the shaft, from which line the plate continues outwards with a planar rear plate portion (18) parallel to the top (5) and bottom (6) walls of the passage towards the fluid outlet (3).

4,064,906

VALVE FOR WATER PIPES

Lennart Gustaf Berg, Fylgiavagen 1, S-182 64 Djursholm, Sweden

Filed Aug. 14, 1974, Ser. No. 497,271
Claims priority, application Sweden, Aug. 28, 1973, 7311664
Int. Cl.² F16K *15/00*
U.S. Cl. 137—529 **3 Claims**



1. A fluid pressure relief valve, comprising:

a. a housing having an inlet opening leading to a through-flow chamber which communicates with an outlet opening, at least a part of said through-flow chamber being a valve seat in the form of a cylindrical wall surface;

b. a spindle slidably guided by said housing for movements in a direction parallel to the axis of said cylindrical wall surface;

c. a piston secured to said spindle for movements along the length of said cylindrical wall surface and having a peripheral seal normally forming a fluid seal therewith, said piston being movable therealong in response to normal variations in fluid inlet pressure, said piston being movable axially beyond said cylindrical valve seat in response to a predetermined excessive fluid inlet pressure to fluidly connect said inlet opening to said outlet opening, said peripheral seal comprising a rigid annular support core of metal, enclosed by a resilient sleeve casing rotatable thereon, whereby as said piston moves along said seat, said casing rolls along said cylindrical wall and rotates about its core;

d. a first preloaded spring acting between said housing and said spindle and biasing said piston in a direction away from said seat; and

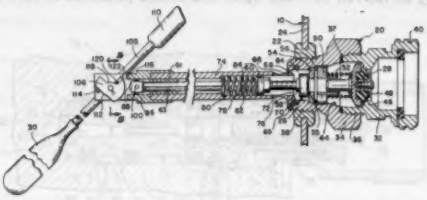
e. a second preloaded spring acting between said housing and said spindle and biasing said piston in a direction toward said seat with a greater force sufficient to override said first spring to maintain said fluid seal during said normal variations.

4,064,907

FILL LIMITING FILLER VALVE UNIT

Evans R. Billington, Glenview, and Robert J. Batka, Chicago, both of Ill., assignors to Rego, Chicago, Ill.

Filed Sept. 30, 1976, Ser. No. 728,038
Int. Cl.² F16K *35/00, 33/00*
U.S. Cl. 137—614.2 **9 Claims**



1. A fill limiting filler valve assembly for a liquefied petroleum gas service tank comprising:

a filler valve housing extendable through the wall of a storage tank and pivotally supporting a cam means at the liquid fill limit of the tank and including a normally closed filler backflow check valve for connection to a pressure filler hose in sealed relation and having a valve member coacting with an inlet port to open under inflowing liquid filling pressure;

fill control means having spaced inner and outer open valve ports with a valve chamber between them through which the replenishing liquid flows;

valve means in said chamber including a valve head and valve stem mounted in said housing for reciprocating the valve head in said chamber to obstruct selectively free flow of liquid through said inner and outer ports;

resilient means urging said valve means to open said inner port in the direction counter to the pressurized inflow;

liquid level responsive means including a float pivotally mounted upon said housing and a cam follower on said valve stem coacting with the cam means when the fill level limit of the tank is approached;

said cam means having a cam surface engaged by said follower to hold said valve means in a full flow open position with respect to said inner port during filling operation, said follower moving from said cam surface into the cam relief recess when the fill limit of the tank is reached to permit flow through said inner valve port to be obstructed by said valve head in the direction of flow under inflowing filling pressures;

bleed means for equalizing pressures on opposite sides of said inner valve when closed against its port; and

said resilient means urging said inner valve to open and retract said follower upon equalization of pressures on opposite sides of said inner valve port.

4,064,908

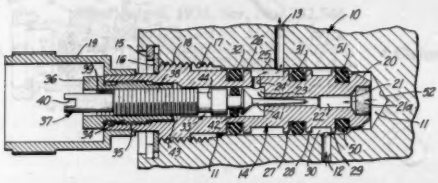
COMBINATION NEEDLE FLOW CONTROL AND SHUT-OFF VALVE FOR PRECISION INSTRUMENTS

Winston C. Loe, 4851 Del Monte Road, La Canada, Calif. 91011

Filed Apr. 5, 1976, Ser. No. 673,753
Int. Cl.² F16K *1/04*
U.S. Cl. 137—614.17 **8 Claims**

1. A combination needle flow control and shut-off valve for precision instruments comprising a body, an elongated opening formed within said body, separated inlet and outlet passages connected with said opening, an elongated cartridge screw threadedly mounted in said body opening for longitudinal movement within said opening to open and close the connec-

tion between said inlet and outlet passages, said cartridge having an opening therein connecting said inlet and outlet passages when said cartridge is disposed in open position, an elongated needle member screw threadedly mounted within said cartridge for longitudinal movement within said cartridge, said needle member having a tapered needle longitudinally movable within said opening in said cartridge for precisely controlling the flow of fluid between said inlet and outlet passages, means connected to the outer ends of said cartridge and needle member for rotating and longitudinally moving said members independently from each other, so that said cartridge may be moved between open and closed positions to turn the



flow of fluid through the valve completely on and off without affecting the precision flow control setting of said needle, an O-ring mounted adjacent to the end of said cartridge surrounding said cartridge, an inwardly extending portion of said body disposed adjacent to said O-ring, said O-ring being adapted to be compressed into sealing engagement with said inwardly extending portion of said body upon inward movement of said cartridge to close off the connection between said inlet passage and said outlet passage, said cartridge having an inner end engageable with the inner end of said body opening after said O-ring has made sealing engagement with said body to limit further inward movement of said cartridge.

4,064,909

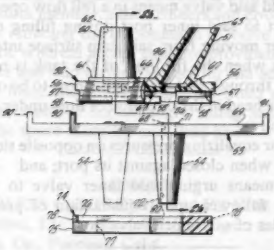
SLIDE VALVE APPARATUS

Theodore C. Neward, c/o Neward Enterprises, 976 W. 9th St., Upland, Calif. 91786

Continuation-in-part of Ser. No. 377,801, July 9, 1973, abandoned. This application Oct. 28, 1975, Ser. No. 626,119

Int. Cl.² F16K *3/316*

U.S. Cl. 137—625.48 **12 Claims**



3. A slide valve for control of contaminable fluids, comprising

a body means defining a flat guideway open at its extremities, and having confronting wall surfaces, one of the wall surfaces having an elongated slot, the opposed wall surface having a shallow depression at least coextensive with the slot,

a resilient sealing plate received in the depression and forming a sealing surface essentially coplanar with the wall surface surrounding the depression,

a slider slidably received in the guide passage disposed in sealing engagement with the sealing plate,

the sealing plate having at least one perforation therethrough,

the body means having at least one tube defining a flow passage in registry with the perforation,

the slider having at least one tube extending through the elongated slot in the body means and defining a flow passage having an end in sealing engagement with the sealing plate and movable between a position in registry with the perforation therein for flow of fluid through the slide valve, and a position closed by the sealing plate, and

the sealing plate being in sealing engagement with and covered by the surface of the depression, and being completely covered by the slider in all positions thereof, thereby to isolate the entire sealing plate from extraneous contamination; and the margins of the perforation being sealed with respect to the body means and the slider in both open and closed positions to prevent leakage into or out of the tube passages.

4,064,910

FLUID CONTROL VALVE

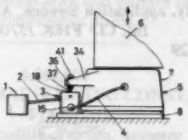
Gottfried Weisenberger, Mainz, Germany, assignor to Effbe-Werk Fritz Brumme & Co. KG, Raunheim, Germany

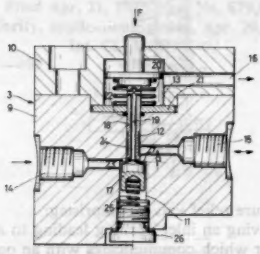
Filed June 8, 1976, Ser. No. 693,777

Claims priority, application Germany, June 10, 1975, 2525763

Int. Cl.² F16K *11/14*

U.S. Cl. 137—627.5 **8 Claims**





1. A control system for controlling the supply of pressurized fluid to a working element, such as a pneumatic spring, which valve comprises a housing having a bore comprising first and second bore sections with a middle bore section of smaller diameter between the first and second sections; a first passage in the housing for connection to a source of said pressurized fluid and communicating with said first bore section; an outlet opening in the housing and communicating with said second bore section; a second passage in the housing for connection to said working element and communicating with said middle bore section; a valve stem sealingly guided in said middle bore section and displaceable in accordance with a controlled variable of said working element, the valve stem having a duct therethrough communicating at one end with said second bore section; a valve closure member which is slidably guided in said first bore section towards the said valve stem and towards a shoulder at the boundary between said first and middle bore sections, the closure member having seating means for closure of said duct in said valve stem and for seating against said shoulder; the said seating means of said closure member being movable away from said shoulder to open a path for conduction of the pressurized fluid from said first to said middle bore section along the surface of said middle bore section; a throttle

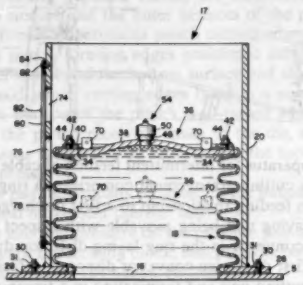
in said conduction path, which throttle is operative in dependence upon the position of the valve stem, the throttle being operative for a small deviation of said controlled variable from a datum, but being inoperative for a large deviation, the end of said valve stem remote from said valve closure member being urged by spring pressure against an abutment which is adjustably attached to said working element; and said abutment being subject to a spring pressure which limits the control range in one direction.

4,064,911

HYDRAULIC FLUID RESERVOIR FOR A CLOSED HYDRAULIC SYSTEM

David E. Albrecht, 1383 Granary Road, Blue Bell, Pa. 19422

Filed Nov. 17, 1976, Ser. No. 742,584
Int. Cl.² F16L *55/04*
U.S. Cl. 138—30 **12 Claims**



1. In combination with a hydraulic fluid reservoir for a closed hydraulic system including a pump the improvement comprising:

a substantially vertically oriented air-tight bellows of substantially uniform cross-section and having open upper and lower ends,

air-tight means including an opening in the top of the reservoir to secure the bellows above the reservoir with substantially the entire cross-section of its lower end in communication with the top of the reservoir,

a cover closing off the upper end of the bellows,

a fill inlet secured to the cover and communicating with the interior of the bellows for filling the reservoir and bellows with hydraulic fluid,

a removable cap for the fill inlet,

substantially vertical guide means to guide the bellows in substantially vertical movement, and

mechanical locking means for holding the bellows in an upwardly expanded position for filling and degassing the hydraulic fluid.

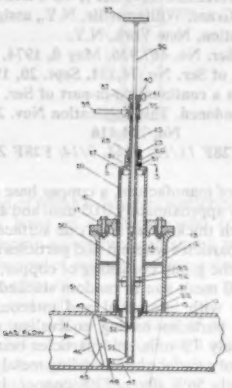
4,064,912

GAS MAIN STOPPER

Joseph A. Petrone, 14 Edith St., Old Tappan, N.J. 07675

Filed Nov. 5, 1975, Ser. No. 628,984
Int. Cl.² F16L *55/10, 55/12*
U.S. Cl. 138—94 **1 Claim**

1. A gas main stopper including a tubular housing insertable into a valve housing for receiving a tapping machine and seatable in gas-tight condition at one end upon a portion of a gas main provided with an opening, a slidable tubular rod extending into said tubular housing through the other end of the tubular housing, a stopper body in contracted condition located in said tubular housing and connected to one end of and supported by said tubular rod for introduction into the main through said opening therein and expansible within the main to stop the flow the gas therethrough, first means at said other end of the tubular housing forming a gas-tight closure for said tubular housing and a gas-tight slide guide for said tubular rod, first actuating means connected to said tubular rod outside of said housing for slidably moving said tubular rod in said first means, second means extending into said tubular rod through the other end of such rod and connected to said stopper body, second actuating means connected to said second means outside of said tubular rod for expanding said stopper body, and third means at said other end of said tubular rod forming a gas-tight closure for said tubular rod and a gas-tight joint with said second means, said first actuating means being operable to slidably advance said tubular rod toward the seated end of said housing to transfer said stopper body from said tubular housing



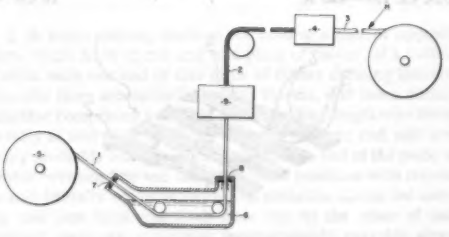
and into said main through the opening in the main, and said second actuating means being operable to retract said second means from said one end of the tubular rod to effect the expansion of said stopper body within the main, said first means being provided with a vent hole for the escape of gas from within said tubular housing and into a venting pipe, and a gas-tight plug normally closing the vent hole, a vent pipe mounted on said other end of said tubular housing and forming an outward extension of the latter, and a coupling enclosing said first means and the vent hole thereof and connecting the adjoining ends of said tubular housing and vent pipe together in gas-tight relation.

4,064,913

FLEXIBLE REINFORCED HOSE AND METHOD OF MAKING THE SAME

Wayne Scott Busdiecker, Stow, and Harold Henry Seymour, North Canton, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Oct. 4, 1976, Ser. No. 729,387
Int. Cl.² F16L *11/00*; C09J *5/02*
U.S. Cl. 138—125 **13 Claims**



1. The method of making a flexible reinforced hose comprising passing nylon tubing through a heated meta-cresol bath effective to plasticize the outer surface of the tubing; wiping

off excess meta-cresol from the tubing as it emerges from the bath; and applying a reinforcement of a synthetic or natural fiber to the wiped plasticized surface of the tubing thus to bond the inner surface of the reinforcement to the tubing.

8. A flexible reinforced hose comprising a nylon core tube having an outer surface plasticized by immersion in a heated meta-cresol bath and wiped to remove excess meta-cresol; and a reinforcement of a synthetic or natural fiber bonded to the plasticized and wiped surface of said core tube.

4,064,914

POROUS METALLIC LAYER AND FORMATION

Andrew Campbell Grant, Williamsville, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 467,936, May 8, 1974, abandoned, which is a division of Ser. No. 74,131, Sept. 20, 1970, Pat. No. 3,821,018, which is a continuation-in-part of Ser. No. 865,512, Oct. 10, 1969, abandoned. This application Nov. 23, 1976, Ser. No. 744,416

Int. Cl.² F28F *13/18*; F16L *9/14*; F28F *21/08*

U.S. Cl. 138—142 **2 Claims**

1. As an article of manufacture, a copper base material tube of grain size below approximately 0.05 mm. and a porous layer less than 0.125 inch thick on at least one surface of said tube comprising metal particles wherein said particles are of a material selected from the group consisting of copper, copper alloy and steel of 30–500 mesh size in random stacked relation as a uniform structure with interstitial and inteconnected pores between adjacent particles having equivalent pore radii of below approximately 7.5 mils, said particles being brazed together and to the tube surface by a bonding metal alloy consisting of approximately 56% silver, 22% copper, 17% zinc, and 5% tin by weight, having a melting point below 1500° F.

2. As an article of manufacture, a copper base material tube of grain size below approximately 0.05 mm. and a porous layer less than 0.125 inch thick on at least one surface of said tube comprising metal particles wherein said particles are of a material selected from the group consisting of copper, copper alloy and steel of 30–500 mesh size in random stacked relation as a uniform structure with interstitial and interconnected pores between adjacent particles having equivalent pore radii of below approximately 7.5 mils, said particles being brazed together and to the tube surface by a bonding metal alloy consisting of 25–95 weight % antimony, 5–75 weight % copper, comprising 10–30 weight % of the metal particle - metal alloy total and having a melting point below 1500° F.

4,064,915

REINFORCEMENT OF RESILIENT ARTICLES

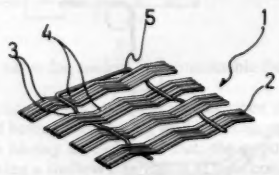
Noel Buyssens, Bossuit, and Germain Verbauwhede, Zwevegem, both of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

Filed May 24, 1976, Ser. No. 689,369

Claims priority, application United Kingdom, May 6, 1975, 24291/75

Int. Cl.² D03D *15/02*

U.S. Cl. 139—425 R **18 Claims**



1. A woven fabric for reinforcing a resilient material, wherein the warp of the fabric consists of substantially unstranded wires held together in spaced groups by the weft of the fabric, at least some of said wires being formed with a set so as to have undulations along their length, and wherein the amplitude of the undulations along their length, and wherein the amplitude of the undulations is substantialy perpendicular to the general plane of the fabric.

4,064,916

ARRANGEMENT FOR INTERMITTENT FEEDING OF CABLE COILS ARRESTING ON A DISTRIBUTION CONVEYOR

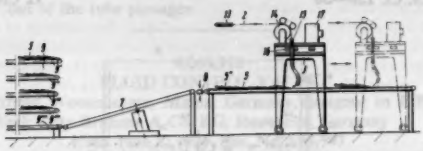
Hans Peter Dahmen, Wipperfurth, Germany, assignor to Bergmann Kabelwerke AG, Wipperfurth, Germany

Filed May 19, 1975, Ser. No. 578,784

Claims priority, application Germany, May 18, 1974, 2424281

Int. Cl.² B21F *23/00*

U.S. Cl. 140—2 **7 Claims**



1. An apparatus for intermittent feeding of cable coils cut by means of a cutting arrangement comprising a ring laying unit disposed in feeding relationship to a first discharge conveyor, said ring laying unit being movable with respect to said first discharge conveyor in the ring laying direction during operation, said first discharge conveyor disposed in facing relationship to a cutting unit and terminating in a transport unit, said transport unit selectively in feeding relationship to one of several separately driven conveyor bands.

4,064,917

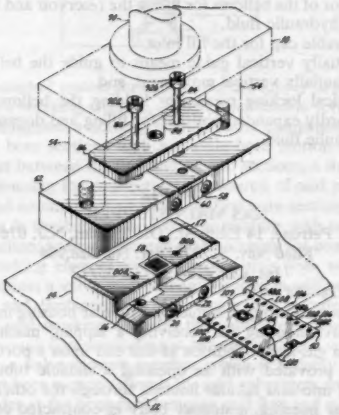
APPARATUS FOR CUTTING AND FORMING FLEXIBLE BEAM LEADS OF AN INTEGRATED CIRCUIT CHIP

Nelson Ramon Diaz, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Pheonix, Ariz.

Filed Oct. 18, 1976, Ser. No. 733,557

Int. Cl.² B21F *1/00*

U.S. Cl. 140—105 **17 Claims**



1. In combination: die wall means, said die wall means having a planar upper surface and contiguous inner surfaces substantialy perpendicular to the upper surface, the inner surfaces of the die wall means forming a die recess, the intersections of the upper surface and the inner surfaces defining continuous die cutting edges lying in a die cutting plane, said die wall

means adapted to be mounted on the base plate of a punch press;

a forming block removably mounted in the die recess; said forming block having an upper surface and contiguous outer surfaces, continuous forming edges positioned substantially at the intersections of said outer surfaces and the upper surface, the outer surfaces of the forming block being spaced a predetermind distance from the inner surfaces of the die to define a punch receiving space, the upper surface of the forming block substantially lying in the die cutting plane, and a recess formed in the upper surface of the forming block adapted to receive a work piece;

punch wall means, said punch wall means having a planar bottom surface, contiguous outer surfaces and contiguous inner surfaces, the inner and outer surfaces being substantially perpendicular to the bottom surface, the inner surfaces forming a punch recess, the intersections of the bottom surface and the outer surfaces of the punch wall means forming continuous punch cutting edges, and continuous punch forming edges positioned substantially at the intersections of the bottom surface and the inner surfaces; said punch cutting edges lying in a punch cutting plane, a portion of the punch wall means adapted to fit within the punch receiving space of the die, said punch wall means adapted to be mounted on the top plate of a punch press;

a pressure pad reciprocally mounted in the punch recess for reciprocal movement therein; and

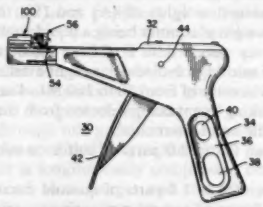
means for exerting pressure on the pressure pad to force the pad toward the forming block, said pressure pad normally projecting below the punch cutting plane.

4,064,918

STRAP TENSION SENSING AND CUT OFF MECHANISM

Walter Pobuta, Elizabeth, and Charles Dolgos, Linden, both of N.J., assignors to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Mar. 10, 1977, Ser. No. 776,489
Int. Cl.[2] B21F *9/02*
U.S. Cl. 140—123.6 **22 Claims**



1. A strap tension sensing and cut off mechanism comprising: stationary block means having a first end and a second end and an intermediate wall intermediate said first and second ends; movable block means having a first end and a second end, said movable block means first end adjacent said stationary block means first end and said movable block means second end adjacent said intermediate wall; means for applying a force to said first end of said movable block means; pin means having a first position in engagement with said movable block means to prevent the movement of said movable block means in response to the force applied thereto and a second position out of engagement with said movable block means to permit movement of said movable block means in response to the force applied thereto; and selectively presettable means coupled to said stationary block means for applying a selected restraining force to said pin means to position said pin means in said first position; said pin means moved from said first to said second position when the force applied to said first end of said movable block means exceeds the selected restraining force upon said pin means.

4,064,919

METHOD OF FILLING DYNAMIC SCATTERING LIQUID CRYSTAL DEVICES

Herman Abraham Stern, Bridgewater; Howard Sorkin, Berkeley Heights, and Henry Claude Schindler, East Brunswick, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 744,128
Int. Cl.[2] B65B *31/00*
U.S. Cl. 141—7 **3 Claims**

1. A method of filling a dynamic scattering liquid crystal cell comprising a layer of a liquid crystal composition having negative dielectric anisotropy containing an ionic dopant between two electrodes, said cell having a single fill port, which comprises the steps of:

evacuating said cell,

immersing said cell in a solution of an ionic dopant in a volatile solvent to fill the cell with said solution,

evaporating the volatile solvent leaving a film of said dopant on the inside walls of the cell,

evacuating said cell, and

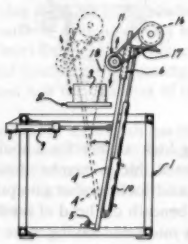
immersing said cell in a dynamic scattering liquid crystal composition containing an ionic dopant to fill the cell.

4,064,920

TENON CUTTING MACHINE WITH CUTTING HEAD

Ernest Piche, 2 Forget St., St. Agathe, Canada

Filed Oct. 21, 1976, Ser. No. 734,736
Int. Cl.[2] B27F *1/08*
U.S. Cl. 144—200 **4 Claims**



1. A tenon cutting machine for cutting a pair of opposite skew tenon faces at one end of a piece of timber, at a cutting station, with one end of said piece of timber defining laterally opposite faces accessible for cutting therein, said tenon cutting machine comprising a straight arm extending lengthwise transversely of said piece of timber adjacent said one end, said arm being pivotable transversely across said one end of the piece of timber between first and second inclined positions with respect to said laterally opposite faces, first actuation means for moving said arm back and forth from one to the other of said inclined positions, a carriage reciprocatively movable along said one arm, second actuation means connected to said one arm and to said carriage to operatively move the latter back and forth along said arm, a cutting head mounted on said carriage and bodily displaceable therewith transversely of said

piece of timber upon reciprocating movement of said arm, said cutting head including a body rotating about an axis extending longitudinally of said piece of timber, at least one cutter radially projecting from said body and having a cutting edge extending longitudinally of the piece of timber, but inclined thereto, to cut a skew tenon face at one of said laterally opposite faces of said piece of timber, said cutting head body further having at one end face thereof at least one routing cutter having a cutting line extending transversely to the cutting axis of the cutting head and for cutting into said piece of timber a transverse face intersecting said skew tenon face, a motor mounted on said carriage and actuating said cutting head, whereby with said arm in one of said inclined positions, the rotating cutter head will cut one skew tenon face at one of said laterally opposite faces of said piece of timber during reciprocation movement of said cutter head and the rotating cutter will cut a second skew tenon face at the other of said laterally opposite faces of said piece of timber upon reciprocating movement of said carriage with said arm positioned in its other inclined position with respect to said piece of timber.

4,064,921

COILED SPRING LOCK WASHER FOR SOCKET BOLTS

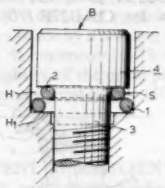
Shigeru Kose, No. 8, 25-Ban, 1-chome, Furuedai, Suita, Osaka, Japan

Filed Sept. 5, 1974, Ser. No. 503,520

Claims priority, application Japan, Sept. 8, 1973, 48-105440[U]

Int. Cl.² F16B *39/24*

U.S. Cl. 151—38 **1 Claim**



1. A coiled spring lock washer for a socket bolt having a head portion and fitted into a member having a socket for receiving said bolt, said lock washer comprised of an elastic wire rod positioned beneath the head of the bolt in said socket and wound conically into a coil having more than one ring and less than two rings, said coil having a lower ring portion and an upper ring portion conically above the lower ring portion beneath the head of the socket bolt, the upper ring portion having an outside diameter slightly larger than the inside diameter of the lower ring portion, and the lower ring portion having an outside diameter slightly smaller than the inside diameter of the socket in which it is positioned, whereby tightening the bolt causes the upper ring portion of the rod above the lower ring portion contacting the underneath side of the head of the bolt to move downward against the inside diameter of the lower ring portion, forcing the lower ring portion to move downward into the socket and to expand the wedge against the side wall of the bottom of the socket, thus forcing the upper ring portion of the rod to wind around the bolt shaft as it is tightened, hereby locking the bolt into position in the socket.

4,064,922

PUNCTURE SEALING COMPOSITION AND TIRE

Milton Farber, Bethany; Frederick C. Loveless, Cheshire, and Robert F. Peterson, Jr., Woodbury, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 557,713, March 12, 1975, Pat. No. 3,981,342. This application May 6, 1976, Ser. No. 683,861

The portion of the term of this patent subsequent to Sept. 21, 1993, has been disclaimed.

Int. Cl.² B60C *21/08*

U.S. Cl. 152—347 **33 Claims**

1. A puncture sealing composition for a tubeless pneumatic tire comprising a fiber-free blend of

A. a major proportion by weight of a low molecular weight liquid elastomer in admixture with a tackifying or plasticizing substance, and

B. a minor proportion by weight of a high molecular weight solid elastomer,

and a crosslinking agent for the elastomers in amount effective to partially crosslink the elastomers to an extent sufficient to prevent the blend from flowing at elevated temperatures and centrifugal forces encountered in the tire in use, the blend having in the partially crosslinked state sufficient adhesion and conformability to function as a sealant in the tire, the amount of (A) being from more than 50% to 90% by weight and the amount of (B) being correspondingly from less than 50% to 10% by weight, based on the combined weights of (A) and (B), the said low molecular weight elastomer being a liquid rubber having a Brookfield viscosity at 150° F of from 20,000 to 2,000,000 cps and the said high molecular weight elastomer having a Mooney viscosity of from 20 to 160 ML-4 at 212° F, the said crosslinking agent being selected from the following, present in the amounts recited:

from more than 0.5 to 2.0 parts of sulfur or sulfur-yielding curative;

from more than 0.5 to 2.0 parts of quinoid curative;

from 0.1 to 1.0 part of radical generating curative;

from 2 to 10 parts of polyisocyanate curative; and

from 2 to 10 parts of tetrahydrocarbyl titanate ester curative,

the said parts of crosslinking agent being by weight based on 100 parts of the combined weight of the two elastomers, the gel content of the blend in the partially crosslinked state being from 15 to 60% by weight of the blend, as measured in toluene at room temperature, and the peak Mooney viscosity of the blend in the partially crosslinked state being from 30 to 55 ML at 150° F.

4,064,923

TIRE VALVE ASSEMBLY

Dale F. German, Roxboro, and Charles Nidle, Durham, both of N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 13, 1976, Ser. No. 676,437

Int. Cl.² B60C *29/00*

U.S. Cl. 152—427 **2 Claims**

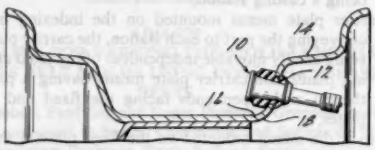
1. A housing assembly for snap-in installation in an aperture provided in a wheel rim, said assembly comprising:

A. a tubular grommet formed of elastomeric material having

first portions thereof defining a circumferential shoulder about the outer periphery thereof and second portions formed on the outer periphery thereof defining a surface adapted to be received in closely fitting relationship with the inner periphery of said rim aperture, said shoulder being adapted for contacting the inner surface of said rim adjacent said aperture;

B. an elongated generally cylindrical stem member having a first circumferential flange portion provided on the outer periphery thereof, said first flange being sized to prevent passage through said rim aperture, said stem having a second flange portion provided thereon and longitudinally spaced from said first flange portion by an amount less than the free length of said grommet with said second flange portion being sized to pass through said rim aperture, said stem having the outer periphery thereof defining a third portion in the region intermediate said first and second flange portions said third portion being sized to provide an interference fit when received in the inner periphery of said grommet; and

C. said stem having a pilot portion adjacent said second flange portion, said pilot portion having the inner periphery of said grommet received thereover in a slip fitting arrangement such that, upon initial insertion of said grommet, with said stem pilot portion received therein into said rim aperture from the interior side thereof and registry of said second portion of said grommet against the inner surface of said rim adjacent said aperture with portions of said grommet extending through said aperture, further movement of said grommet in said aperture is prevented and upon further insertion of said stem through said aperture and passage of said second flange portion of said stem through the inner periphery of said grommet disposing said first flange portion on the opposite side of said rim aperture from said first stem flange portion and upon application of a longitudinal force to said stem causing compression of portions of said grommet intermediate said first stem flange and said rim, said second stem flange passes through said grommet and extends free thereof and upon release of said longitudinal force on said stem, said grommet is longitudinally compressed between said first and second stem flanges and the said portions of said grommet extending through said aperture are compressed longitudinally to provide a fluid pressure seal around said rim aperture between said grommet shoulder on one side of said rim aperture and said grommet portions extending through said aperture on the other side of the said rim aperture.



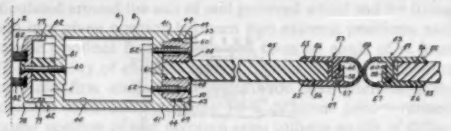
4,064,924

TRAFFIC DOOR

John C. Catlett, Milwaukee, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed Dec. 24, 1975, Ser. No. 644,053
Int. Cl.² A47H *23/00*
U.S. Cl. 160—354 **7 Claims**

1. A traffic door to be mounted in a doorway and comprising a frame, means for mounting the door for swinging movement between an open and a closed position, a panel carried by the frame, an edge seal strip connected to a vertical edge of the panel, said strip being generally U-shaped in cross section and including a central generally flexible section and a pair of substantially rigid arms extending outwardly from the central section and disposed in engagement with opposite sides of the panel, said arms having serrations on the surfaces thereof facing the panel, and locking means connected to said arms and located between the flexible section and the panel, said locking means including cooperating male and female locking elements with said elements having cooperating ratchet type teeth.

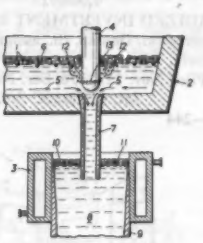


4,064,925

CONTINUOUS CASTING METHOD AND APPARATUS

Thorwald Fastner; Alois Niedermayr, both of Linz; Johann Nakesch, Pasching, and Max Turmer, Linz, all of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Feb. 20, 1976, Ser. No. 659,920
Claims priority, application Austria, Feb. 25, 1975, 1402/75
Int. Cl.² B22D *11/10*
U.S. Cl. 164—66 **6 Claims**



1. A continuous casting method of treating metal salts with flush gas, which comprises the steps of:

supplying molten metal contained in a tundish and covered by a layer of slag particles into a continuous casting mould through an outflow opening in said tundish,

introducing an inert flush gas at a distance above the outflow opening in said tundish during casting, said distance being equal to at least half the diameter of the outflow opening, and

adjusting the amount of inert flush gas introduced to from at least 30 Nl to at most 300 Nl per minute, to form upwardly rising gas bubbles in said tundish, thereby preventing slag particles from being supplied to the mould together with the molten metal.

4,064,926

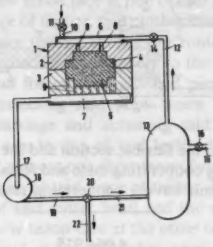
SAND MOLDING APPARATUS WITH MEANS FOR RECIRCULATING CATALYST

Robert Naegele, Erding, Germany, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed May 17, 1976, Ser. No. 686,838
Claims priority, application Germany, June 16, 1975, 2526875
Int. Cl.² B22C *9/12*
U.S. Cl. 164—154 **51 Claims**

1. An apparatus for hardening a molding article in a molding box which is connected through a feed line provided with a shut-off valve to a catalyst gas source, through a vent line provided with a shut-off valve to the atmosphere and through a suction line to a vacuum pump which evacuates the molding box and sucks the catalyst gas through the molding article for the purposes of hardening, wherein the improvement com-

prises a reversible valve assembly having an inlet and first and second outlets, means connecting said inlet to the pressure side of the vacuum pump, means connecting said first outlet to a return line leading to the catalyst gas source and said second



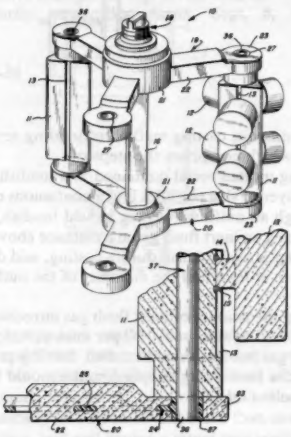
outlet to atmosphere, whereby the reversible valve assembly, in one position, connects the pressure side of the vacuum pump to said return line leading to the catalyst gas source and, in the other position, connects the pressure side of the vacuum pump to the atmosphere.

4,064,927

STANDARDIZED INVESTMENT MOLD ASSEMBLY

Richard C. Ostrowski, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 11, 1976, Ser. No. 740,995
Int. Cl.² B22C 7/02
U.S. Cl. 164—244 **18 Claims**



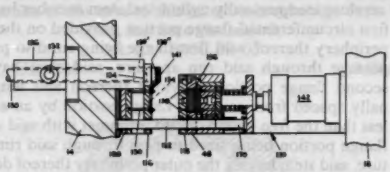
12. A rigidified investment casting wax mold comprising: a first wax sprue forming means; thermally decomposable reinforcing means embedded within said sprue forming means, the strength of the material forming said reinforcing means being substantially greater than that of the sprue forming wax at ambient temperatures thereby causing the reinforced sprue forming means to be rigid; a second wax sprue forming means; second thermally decomposable reinforcing means embedded within said second sprue forming means, said first and second reinforcing means defining interfitted connecting portions for causing the first and second sprue forming means to define a continuous sprue former; and a plurality of wax patterns secured directly to said first wax sprue forming means in substantially spaced relationship to said reinforcing means thereof.

4,064,928

DIE CASTING MACHINE

William G. Wunder, Hamilton, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Nov. 30, 1976, Ser. No. 745,991
Int. Cl.² B22D 17/10, 17/24, 19/00
U.S. Cl. 164—264 **25 Claims**



1. Die casting apparatus for casting a part comprising:

a pair of opposed pressure plates, one plate being a fixed plate and the other plate being a traveling plate, the traveling plate being relatively movable in an axial direction toward and away from the fixed plate to close and open the die casting apparatus;

indexing means mounted between the plates for moving the part through a plurality of separate stations, one station being a casting station;

carrier plate means mounted on the indexing means for conveying the part to each station, the carrier plate means being axially movable independent of the fixed and traveling plates, the carrier plate means having a part cavity therein with open ends facing the fixed and traveling plates;

cover die means mounted on the fixed plate at the casting station for axial movement with respect to the fixed plate, the cover die means having an inner side facing the traveling plate and an outer side facing the fixed plate, the cover die means covering one end of the part cavity when the die casting apparatus is closed, the cover die means having gate means therein for conveying molten casting material through the outer side of the cover die means into the interior of the carrier plate part cavity, the gate means being formed such that after a part has been cast, solidified material forming a runner system leading to the cast part can be broken from the cast part by axially moving the cast part away from the runner system;

a runner plate mounted on the fixed plate between the fixed plate and the outer side of the cover die means, the runner plate including runner cavity means in the surface thereof for conveying molten material under pressure along the outer side of the cover die means to the gate means for injection into the part cavity when the die casting apparatus is closed;

ejector die means for covering the other open end of the part cavity in the carrier plate when the carrier plate is in the casting station, said ejector die means being mounted on the traveling plate;

means for moving the traveling plate between open and closed positions so as to open and close the die casting apparatus, the runner plate, cover die, carrier plate, and ejector die all being pressed together when the die casting apparatus is closed, such that molten material injected into the runner conduits under pressure is conveyed into the interior of the part cavity, the traveling plate being moved outwardly a third predetermined distance in moving from its closed to its open position;

means for injecting molten material into the part cavity through the runner cavities and gate means when the die casting apparatus is closed;

cover die operating cylinder means for moving the cover die means outwardly from the runner plate after the completion of a casting operation so as to expose the runner system and break the runner system from the cast part at the gate means, the cover die means and runner plate being formed such that the runner system remains at-

tached to the runner plate when the cover die means is moved away from the runner plate, the cover die operating cylinder means keeping the cover die means pressed against the carrier plate means as the traveling plate moves away from the fixed plate, the cover die operating cylinder means stopping the outward movement of the cover die means after it is moved outwardly a first predetermined distance, said first predetermined distance being shorter than said third predetermined distance, movement of the traveling plate beyond said first predetermined distance serving to remove the cover die from the cast part and carrier plate;

ejector die ejector means for stopping outward movement of the carrier plate means after the carrier plate means has moved outwardly a second predetermined distance, the second predetermined distance being greater than the first predetermined distance but less than the third predetermined distance, movement of the traveling plate past said second predetermined distance serving to separate the ejector die means from the cast part and carrier plate means, leaving the carrier plate means free for movement to a subsequent station; and

runner ejector means for dislodging the runner system from the runner plate after the cover die means has moved away from the cover plate.

4,064,929

APPARATUS FOR VARYING THE MOLD LENGTH OF ENDLESS BELT MOLDS USING INTERCHANGEABLE BELTS

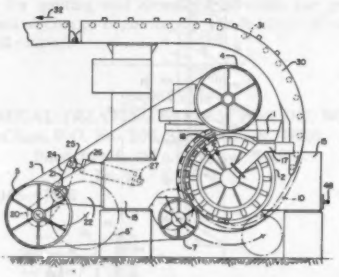
Andre Quehen, Pontoise, and Roger Figueres, Grenoble, both of France, assignors to Secim, Courbevoie and Societe de Vente de l'Aluminium Pechiney, Paris, both of, France

Continuation-in-part of Ser. No. 480,560, June 18, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,797

Claims priority, application France, June 26, 1973, 73.23326

Int. Cl.[2] B22D *11/06*

U.S. Cl. 164—433 **3 Claims**



1. Improved machine for the continuous casting of a metallic ribbon comprising a grooved wheel, a base, bearings on said base supporting said grooved wheel, means for rotating said grooved wheel, a motor wheel, a first endless metallic ribbon on said motor wheel and partially surrounding said grooved wheel to form a mold, said motor wheel being substantially tangent to said grooved wheel, bearings mounted on said base for mounting said motor wheel relative to said grooved wheel, means operatively assoicated with said motor wheel for rotating said motor wheel at the same peripheral speed as said grooved wheel, a first guide wheel operatively assoicated with said endless metallic ribbon for tensioning said ribbon, movable bearings for moving said first guide wheel mounted on said base, means operatively associated with said movable bearings for moving said movable bearings in a direction tending to apply said ribbon against the periphery of said grooved wheel at a specific tension, a second guide wheel operatively associated with said ribbon, bearings mounting said second guide wheel, arm means supporting said bearings mounting said second guide wheel and pivoting around the axis of rotation of said grooved wheel, the distance between the centers of said two guide wheels being practically equal to the sum of their radii such that said second guide wheel remains substantially tangent to said grooved wheel, means for pivoting said arms articulated around the axis of said grooved wheel and for fixing them in a given position between two extreme positions, said extreme positions forming between them an angle of at least 90°, a plurality of endless metallic ribbons of different lengths from said first endless metallic ribbon and interchangable therewith each corresponding to a different predetermined angular position of said pivoting arms to form molds of different lengths, means operatively associated with the grooved wheel and endless metallic ribbon for pouring liquid metal at the entry of the part of the groove closed by said ribbon in the zone where said motor wheel of the ribbon is substantially in contact with said grooved wheel, means operatively associated with said grooved wheel for cooling the periphery of said grooved wheel, and means operatively associated with said grooved wheel and second guide wheel for guiding the solidified metal blank from the zone where it leaves the groove and where said second guide wheel is substantially in contact with said grooved wheel.

4,064,930

CONTINUOUS CASTING METHOD USING A LADLE BOGIE

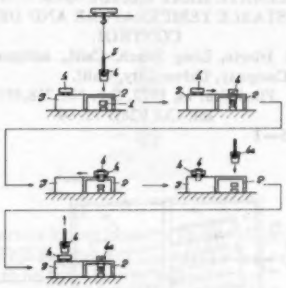
Shoji Nakamura, Hirakata, Japan, assignor to Kyoei Steel Ltd., Osaka, Japan

Filed Feb. 3, 1977, Ser. No. 765,405

Claims priority, application Japan, July 8, 1976, 51-81791

Int. Cl.[2] B22D *11/10*

U.S. Cl. 164—82 **1 Claim**



1. A method of continuous casting using a crane and a ladle bogie which is adapted to travel between a ladle shunting position and a position right above a tundish, comprising the steps of:

a. disposing the bogie on a stand in the shunting position;

b. placing a ladle filled with molten steel on a stand right above a tundish by the use of a crane and then teeming steel;

c. causing the bogie to retreat to the shunting position and thereafter supplying a new ladle filled with molten steel onto the stand right above the tundish, thus exchanging ladles quickly for continuous teeming.

4,064,931

FUSION-TYPE THERMAL STORAGE ACCUMULATOR WITH DISCHARGING APPARATUS

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen, Germany

Filed Sept. 24, 1975, Ser. No. 616,241

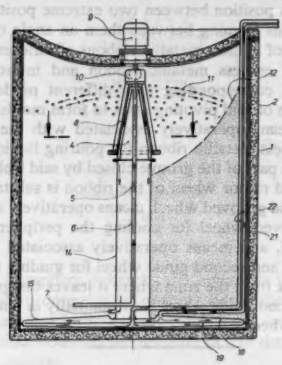
Claims priority, application Austria, Sept. 30, 1974, 7857/74

Int. Cl.[2] F28D *21/00*

U.S. Cl. 165—1 **7 Claims**

1. Apparatus for thermally discharging a heat storage accu-

mulator containing a fusible storage substance the density of which in the solid state is larger than in the liquid state, characterized in that the accumulator has a heat transfer component located at the center of the accumulator, a heat exchange component located at the bottom of the accumulator and



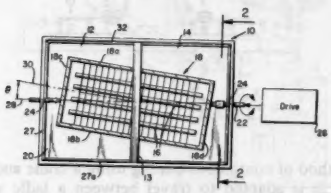
through which a fluid heat carrier is conducted and where the heat exchange component is subdivided by an intermediate wall into two chambers which intercommunicate along the periphery of the component, and means for producing an angular motion of the storage substance in its liquid state around said heat transfer component.

4,064,932

ALL CLIMATE HEAT EXCHANGER UNIT WITH ADJUSTABLE TEMPERATURE AND DEFROST CONTROL

Wilfrido R. Iriarte, Long Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 14, 1977, Ser. No. 768,457
Int. Cl.² F28D *15/00*
U.S. Cl. 165—1 **13 Claims**



12. A heat exchanger including heat pipes in and thermally coupling at least two paths of fluid flows, in which said heat pipes are angularly movable about an axis, characterized in that said heat pipes have a fixed angular offset from the axis and an angular inclination with respect to gravity for unidirectional transfer of thermal energy between said fluid flow paths.

4,064,933

DEVELOPING ROLLER APPARATUS FOR REPRODUCTION MACHINES

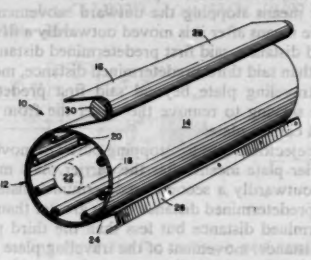
Gordon A. Schuman, Rolling Meadows, Ill., assignor to Dietzgen Corporation, Des Plaines, Ill.

Filed Sept. 29, 1975, Ser. No. 617,784
Int. Cl.² F28D *11/02*
U.S. Cl. 165—89 **2 Claims**

1. A developing roller for use in the development of heat-sensitive copy sheets in a reproduction machine, said roller comprising:

a hollow, thin-walled heat conducting cylinder rotatably mounted in the reproduction machine;

a plurality of relatively small diameter heat pipes mounted along the inner wall of said cylinder between its ends; and



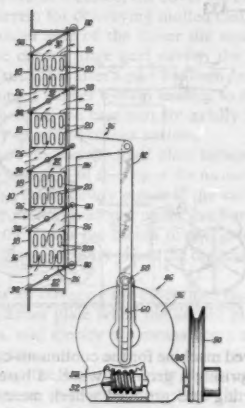
a means for heating said cylinder and heat pipes located within the hollow interior of said cylinder.

4,064,934

RADIATOR AIR FLOW CONTROL MECHANISM

Clyde Paul Kolthoff, Jr., Naperville, and Otto J. Brennolt, Woodridge, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 7, 1975, Ser. No. 629,932
Int. Cl.² F28F *13/02, 13/12, 27/02;* F01P *7/00*
U.S. Cl. 165—97 **6 Claims**



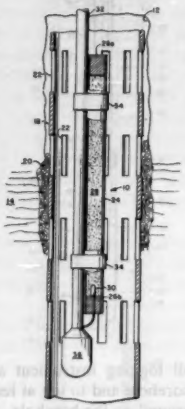
1. An improvement in a radiator system of the type having a radiator core comprising a plurality of parallel spaced core sections arranged in a row with the opposing faces of adjacent core sections being open to define an air flow passageway through each core section at a constant transverse angle to the direction that the cooling air is delivered towards said row of core sections, said improvement comprising gate means having a first position for directing the cooling air through each of said air flow pageways of said core sections in one direction and having a second position for directing the cooling air through each of said air flow passageways in the opposite direction to said one direction, and drive means for continuously reciprocating said gate means between said first and second positions.

4,064,935

OIL WELL STIMULATION APPARATUS

Henry H. Mohaupt, Santa Barbara, Calif., assignor to Kine-Tech Corporation, Sacramento, Calif.

Filed Sept. 13, 1976, Ser. No. 722,796
Int. Cl.[2] E21B 43/26
U.S. Cl. 166—63 6 Claims



1. An apparatus for stimulating the flow of oil and well fluids in an oil well comprising

means defining an elongated fluid proof frangible housing adapted to be received in an oil well bore,

an elongated, generally evenly distributed burnable chemical gas generating charge having a generally uniform cross section along the length of said charge, and having a linear flame propagation velocity less than the velocity of sound in the well fluid located within said fluid proof frangible housing, and

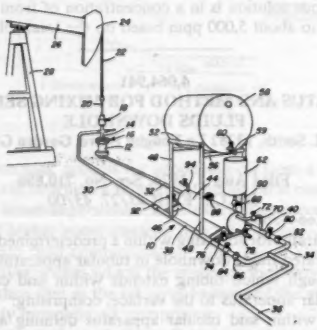
means for igniting said elongated burnable gas generating chemical charge beginning at one location of said elongated charge.

4,064,936

CHEMICAL TREATING SYSTEM FOR OIL WELLS

L. C. McClure, P.O. Box 505, Midland, Tex. 79701

Filed July 9, 1976, Ser. No. 704,076
Int. Cl.[2] E21B 3/03
U.S. Cl. 166—75 R 9 Claims



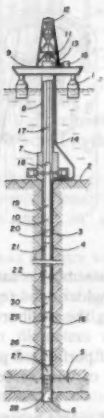
1. An oil well treating system in which the oil well includes a casing in the bore hole and a production tubing string in the casing, said system comprising a pipe communicated with the upper end of the production tubing string and a pipe communicated with the upper end of the casing, said pipes extending away from the oil well and disposed in spaced relation, a stand rigidly interconnecting said pipes and extending above the pipes, a supply tank for chemical additive supported by said stand, a measuring container supported by said stand below the supply tank for receiving a predetermined quantity of chemical additive therefrom, a mixing vessel supported from said stand below the mixing container and communicated therewith, said mixing vessel being disposed above said pipes, a bypass line extending from each of said pipes to said mixing vessel with valves in each of the bypass lines to enable circulation of fluid through the mixing vessel and pipes for flushing chemical additive in the mixing vessel into the oil well for treating down hole equipment in the well.

4,064,937

ANNULUS PRESSURE OPERATED CLOSURE VALVE WITH REVERSE CIRCULATION VALVE

Burchus Q. Barrington, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 16, 1977, Ser. No. 769,129
Int. Cl.[2] E21B 43/12, 47/00
U.S. Cl. 166—162 7 Claims



1. An apparatus for use in testing an oil well having a testing string in a borehole extending from the surface of the earth to a formation to be tested, comprising:

a cylindrical housing adapted to be incorporated in said testing string, having an open bore therethrough, and a power port and a circulating port through the walls thereof;

a power mandrel in said open bore having an annular piston for moving said power mandrel in a first direction responsive to fluid pressure exterior of said cylindrical housing communicated to said annular piston through said power port;

frangible restraining means between said power mandrel and said cylindrical housing for restraining movement of said power mandrel in the first direction until the pressure exterior of said housing exceeds a predetermined value, and for frangibly releasing said power mandrel when said pressure exterior of said housing exceeds said predetermined value;

full opening closure valve means in said cylindrical housing having a normally open position and a closed position for providing a fully open flow passageway through the open bore in said housing when in the normally open position;

connecting means connecting said full opening closure valve means to said power mandrel including means for moving said closure valve from the fully open position to a fully

closed position responsive to movement of said power mandrel in the first direction;

first releasing means in said connecting means for selectively releasing said connecting means from said power mandrel after said power mandrel has moved a predetermined distance in the first direction; and

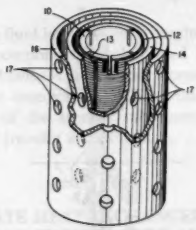
circulation valve means in said housing including a sliding valve mandrel having a normally closed position closing said circulating port and an open position opening said circulating port, said circulation valve means including means for moving said sliding valve mandrel from the closed position to the open position responsive to a predetermined amount of movement of said power mandrel in the first direction.

4,064,938

WELL SCREEN WITH EROSION PROTECTION WALLS

Clarence R. Fast, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 12, 1976, Ser. No. 648,357
Int. Cl.[2] E21B *43/08*
U.S. Cl. 166—236 **2 Claims**



1. A sand screening assembly resistant to erosion when used in oil and gas wells in which sand tends to be entrained in the stream of fluid entering the wellbore, said assembly comprising:

a. an inner section of perforated pipe;

b. at least one layer of wire screen positioned around said pipe; and

c. a stream-deflecting means having an erosion-resistant wall at least one-fourth inch thick positioned around said layer of wire screen for deflecting said stream of fluid to prevent direct impingement of said stream on said layer of wire screen, wherein said stream-deflecting means comprises an outer portion of resilient, petroleum-resistant, elastromeric material, and an inner portion of rigid metal.

4,064,939

METHOD AND APPARATUS FOR RUNNING AND RETRIEVING LOGGING INSTRUMENTS IN HIGHLY DEVIATED WELL BORES

Gerald L. Marquis, London, England, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 1, 1976, Ser. No. 737,922
Int. Cl.[2] E21B *47/00*
U.S. Cl. 166—253 **4 Claims**

1. A method for logging the formations surrounding an earth borehole, comprising:

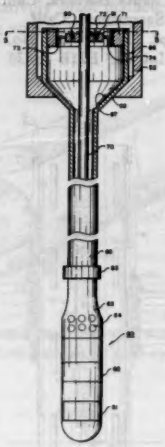
running a string of drill pipe within an earth borehole;

running a string of tubing inside the said string of drill pipe, said string of tubing having a well logging instrument attached to the lower end of said tubing;

lowering a weighted probe attached to a well logging cable through said tubing until said probe makes electrical contact with said well logging instrument;

clamping said cable to an upper head member attached to the uppermost end of said string of tubing;

lowering said tubing and said well logging instrument out the lower end of said drill pipe; and



causing said well logging instrument and said tubing to traverse said borehole and to log at least a portion of the formations surrounding the borehole.

4,064,940

WATER CONTROL WITH POLYMERS

Derry D. Sparlin, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Nov. 8, 1976, Ser. No. 739,418
Int. Cl.[2] F02D *3/14*
U.S. Cl. 166—295 **6 Claims**

1. An improved method of treating a subterranean formation for reducing the flow of aqueous liquids therethrough by injecting a solution of polymer into said formation through a well bore, the improvement comprising injecting a dispersion of

a. a thermoplastic or thermosetting cross-linked or non-cross-linked water-insoluble polyamide having recurring amide groups as an integral part of the main polymer chain, together with

b. an aqueous solution of a water-soluble polymer, wherein

c. the water-insoluble polyamide is dispersed in water in a concentration of from about 10 parts per million (ppm) to 30% by weight and the water soluble polymer in the aqueous solution is in a concentration of from about 100 ppm to about 5,000 ppm based on the total solution.

4,064,941

APPARATUS AND METHOD FOR MIXING SEPARATED FLUIDS DOWNHOLE

Donald M. Smith, 13282 La Vaughn Drive, Garden Grove, Calif. 92664

Filed Aug. 2, 1976, Ser. No. 710,886
Int. Cl.[2] E21B *43/27, 43/00*
U.S. Cl. 166—300 **29 Claims**

1. Apparatus for admixing within a predetermined time span, two separated fluids downhole in tubular apparatus in a cased well through which tubing extends within said casing from said tubular apparatus to the surface, comprising:

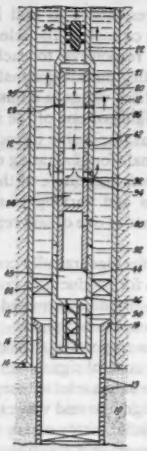
means within said tubular apparatus defining a first fluid compartment,

means within said tubular apparatus defining a second fluid compartment,

means within said tubular apparatus for separating fluids contained in said first and second compartments,

means including a displacement fluid actuatable from the

surface through said tubing for displacing said separating means downhole to permit downhole admixture of the fluids in said first and second compartments, said tubular apparatus including a ported tubular member which is affixed to the lower end of said tubing and in fluid communication with said tubing, and a ported sliding sleeve



movably disposed within said tubing member for displacing said separating means to admix said first and second fluids in said tubular apparatus, and

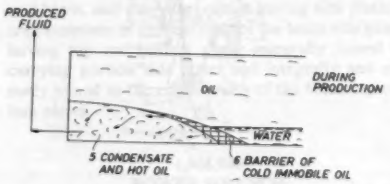
an in-line mixer adjacent the lower end of said tubular apparatus for intimately mixing said admixture preparation to injection of said mixture into a well zone.

4,064,942

AQUIFER-PLUGGING STEAM SOAK FOR LAYERED RESERVOIR

Michael Prats, Houston, Tex., assignor to Shell Canada Limited, Toronto, Canada and Shell Explorer Limited, Houston, Tex.

Filed July 21, 1976, Ser. No. 707,170
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—303 **7 Claims**



1. A steam soak process for producing oil from a subterranean reservoir in which a relatively viscous oil is contained in a relatively steam impermeable layer overlying a more permeable layer of higher water content, into which reservoir a well is opened into fluid communication with at least a portion of the water layer within which the steam permeability tends to be greater than that in the oil layer because of the absence of the relatively immobile oil, comprising:

injecting steam through the well and into the resevoir at a relatively high rate and volume sufficent to heat the normally relatively immobile reservoir oil, displace a bank of heated oil radially outward and downward into a portion of the water layer, and cause the steam injectivity to become significantly decreased; and

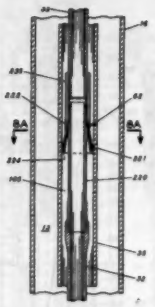
subsequently producing oil by reducing the pressure in the well borehole and withdrawing fluid from the zone immediately around the well and closer to the well than the so-displaced oil bank, which zone contains relatively highly pressurized hot water and oil.

4,064,943

Plugging Permeable Earth Formation With Wax

Daniel C. Cavin, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 6, 1976, Ser. No. 748,034
Int. Cl.[2] E21B *43/27, 33/138*
U.S. Cl. 166/281 **8 Claims**



1. A process for reducing the permeability of a subterranean earth formation which is exposed to the fluid in the borehole of a well, comprising:

mixing molten wax substantially homogeneously with an emulsifying agent consisting essentially of at least one salt of a surface active amine or quaternary ammonium compound;

dispersing the molten wax mixture within an aqueous liquid to form an oil-in-water emulsion of relatively high shear stability by imparting sufficient agitating force to form a dispersion in which substantially all of the dispersed particles have mean diameters of less than about 4 microns and adjusting the pH of the aqueous phase to less than about 4;

dissolving a pH-increasing reactant within the aqueous phase of the emulsion, at least substantially as soon as the emulsion flows into the earth formation to be treated, with the kind and amount of said reactant being such that its reaction causes the emulsion to break relatively soon after the emulsion and the reactant have been subjected to the time-temperature exposure involved in flowing a fluid into the earth formation; and

flowing the reactant-containing emulsion into the earth formation at a rate such that wax is deposited within and near the exposed face of the earth formation.

4,064,944

APPARATUS FOR FIRE EXTINGUISHING SYSTEM FOR FLOATING-ROOF TANKS

William F. McClure, SRA Box 1707, Anchorage, Alaska 99507, and David L. Brown, P.O. Box 581, Boyertown, Pa. 19512

Filed Apr. 9, 1976, Ser. No. 675,294
Int. Cl.[2] A62C *35/54, 37/02, 35/18*
U.S. Cl. 169—60 **2 Claims**

1. A fire extinguishing system comprising:

a source of pressurized expellant fluid;

an agent container containing liquid fire extinguishing agent;

said agent container including an expellant inlet and an agent outlet;

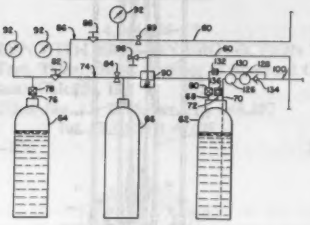
expellant conduit means for conducting expellant fluid from said expellant source to said expellant inlet of said liquid agent container;

control valve means in said expellant conduit means for blocking communication between said expellant source and said liquid agent container until a fire is sensed;

a sprayer duct connected to said agent outlet of said liquid agent container and extending into an area being protected;

an accumulator communicating continuously with said expellant source by being connected with said expellant supply conduit at a point upstream of said control valve means to be pressurized by pressure from said expellant source;

a flow control member in said expellant conduit means



disposed upstream of said accumulator communication point for metering the flow of expellant fluid; and

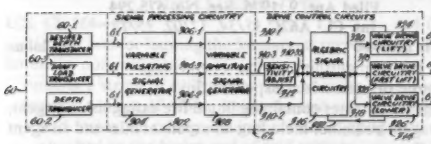
fire sensing means for detecting a fire in said area being protected and for deactuating said control valve means to in response to fire detection to admit a surge of pressure from said accumulator to said agent container to rapidly displace agent into said sprayer duct, and thereafter admit metered pressure from said expellant source to discharge agent from said sprayer duct at a controlled rate.

4,064,945

ELECTRONIC DEPTH CONTROL SYSTEM

Robert M. Haney, Rockford, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 10, 1975, Ser. No. 556,531
Int. Cl.[2] A01B *63/114*
U.S. Cl. 172—4 **10 Claims**



1. An electrical control system for controlling the depth of a vehicle drawn implement of the type having means connecting the implement to the vehicle, hydraulic motor means operable to raise and lower the implement to change the depth thereof, electrically operated valve means for effecting operation of said hydraulic motor means, and means for indicating the values of selected ones of a plurality of variables including a desired depth of the implement, the actual depth of the implement, and the draft load, said control system generating control signals for operating said valve means as a function of the relationship between values of the variables, said control system comprising:

transducer means responsive to said indicating means for sensing the value of each of the selected variables;

first circuit means responsive to each of said transducer means for generating pulsating signals each having a pulse repetition rate which varies as a function of and is representative of the value of one of the selected variables;

second circuit means responsive to each of said representative pulsating signals for generating electrical signals each having an amplitude indicative of the value of one of the selected variables and varying in accordance with the pulse repetition rate of one of said representative pulsating signals;

third circuit means for algebraically combining said variable amplitude signals for producing a combined signal having a polarity and amplitude determined by the algebraic sum of said variable amplitude signals;

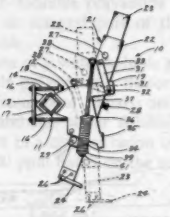
fourth circuit means responsive to said combined signal for generating valve control signals in response to said combined signal exceeding a selected amplitude and for applying said control signal to said valve means to effect operation of said hydraulic motor means to selectively raise or lower said implement as a function of the polarity of said combined signal.

4,064,946

SPRING TRIP MECHANISM

Arnold E. Ernst, Wolverton, Minn. 56594

Filed Oct. 10, 1975, Ser. No. 621,470
Int. Cl.[2] A01B *61/04*
U.S. Cl. 172—710 **7 Claims**



2. A device for connection to an earth working tool comprising:

a housing having a slot therein;

means for connecting said housing to a tool bar;

a tool holding rod extending through said slot, said rod having an earth working tool connected to the bottom end thereof;

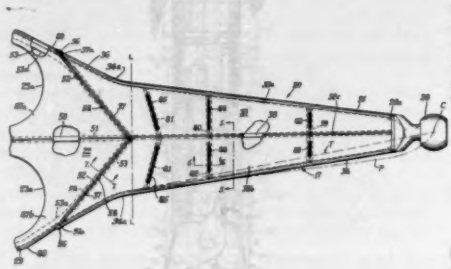
at least one lever, said lever having a first pivotal connection on one end thereof pivotally connecting said lever to said housing, said lever having a second pivotal connection on the other end thereof pivotally connecting said lever to said rod; said lever acting as constraining means for said rod constraining said rod to a state of motion wherein as said rod pivots with respect to said housing, the axis around which said rod pivots moves upwardly with respect to said housing.

4,064,947

DRAW BAR FOR A MOTOR GRADER

Carroll Richard Cole, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 27, 1976, Ser. No. 661,880
Int. Cl.[2] E02F 3/76
U.S. Cl. 172—781 20 Claims



1. An improved motor grader circle mounting bar structure which has a connecting end provided with an integral ball which is adapted to be attached to a motor grader frame for universal movement about its own center, and which has a carrying portion adapted to be suspended from said frame by means which may pivot the mounting bar about said ball center, and said carrying portion being adapted to carry a circle structure for a grader blade, said improved mounting bar structure comprising, in combination:

a box-like beam the width of which increases from its connecting end toward said carrying portion, said beam having side plates, a top plate and a bottom plate both of which fill the entire space between the side plates from said connecting end to said carrying portion, and longitudinal and transverse internal vertical webs, the increase in width of said beam from its connecting end to the intersections of the side plates with a transverse plane which is near to but outside the circle being such that the side plates lie entirely between,

a. an isosceles triangle plotted between the ball center and said intersections and

b. a parabola plotted between said center and said intersections

and a mounting bar carrying portion of box-like cross-section which is structurally integral with the wider end of said beam, said carrying portion having side plates which are extensions of the rear ends of the beam side plates, and having top and bottom plates integrally joined to said carrying portion side plates and integrally and continuously joined to the entire width of the beam top and bottom plates.

4,064,948

POWER WRENCH

Bratt, and Carl Ake Moberg, both of Tyreso, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 15, 1976, Ser. No. 666,586
Claims priority, application Sweden, Mar. 18, 1975, 7503039
Int. Cl.[2] B23Q 5/027
U.S. Cl. 173—12 7 Claims

1. A power wrench comprising:

a motor (14),

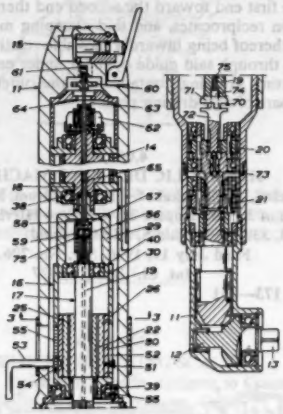
an output shaft (12) powered by said motor (14),

a torque responsive release clutch (16, 17) comprising a driving half (16) and a driven half (17) and being located between said motor (14) and said output shaft (12), said release clutch halves (16, 17) being angularly displaceable relative to each other between an unloaded position and a released position,

a disengageable torque non-responsive clutch (70) located between said release clutch (16,17) and said output shaft (12),

cam means (57,58) non-rotatably connected to the halves of said release clutch (16,17) so as to interengage upon relative rotation of said release clutch halves, and

a maneuver means (75) operatively connecting said cam means (57,58) to said torque non-responsive clutch (70) for disengaging said torque non-responsive clutch upon interengagement of said cam means (57,58),



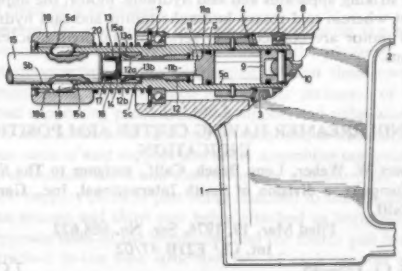
said cam means (57,58) being, when said release clutch (16,17) is unloaded, interspaced a distance substantially corresponding to the relative angular displacement of said release clutch halves (16,17) between said unloaded position and said released position, whereby said cam means (57,58) remains inactive until said release clutch halves have reached said released position.

4,064,949

ELECTROPNEUMATIC HAMMER

Franz Chromy, Feldkirch-Levis, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Sept. 10, 1976, Ser. No. 722,028
Claims priority, application Germany, Sept. 12, 1975, 2540838
Int. Cl.[2] E21C 3/00
U.S. Cl. 173—14 12 Claims



1. In an electropneumatic hammer comprising a housing, an axially extending guide cylinder within said housing, said guide cylinder forming an axially extending bore having a forward end and a rearward end, an exciter piston displaceably mounted within the bore in said guide cylinder, a driving piston displaceably mounted within the bore in said guide cylinder between said exciter piston and the forward end of the bore, wherein the improvement comprises an axially extending

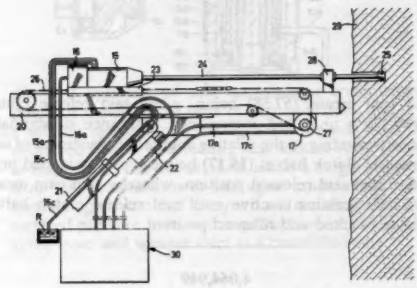
clamping member located within the bore with the axis thereof disposed in parallel relation with the axis of the bore and said clamping member secured against axial displacement in the bore, said clamping member having a first end and a second end with said second end spaced forwardly of said first end toward the forward end of said bore, said driving piston having a first part located adjacent to said exciter piston and a second part extending from said first part toward the forward end of the bore, said second part having an axially extending outer surface thereon arranged to be gripped by said clamping mamber and said surface extending through said clamping member from the first end toward the second end thereof as said driving piston reciprocates, and said clamping member having a portion thereof being inwardly movable relative to the axis of the bore through said guide cylinder under certain conditions for effecting gripping contact with the outer surface of the second part of said driving piston.

4,064,950

HYDRAULIC DRILLING MACHINE

Pekka Salmi, Tohlopinkatu 5-7 B; Rolf Strom, Kohmankaari 1 B 5, both of 33310 Tampere 31, and Eero Hirvisaari, Kreetantie 7 E 56, 33950 Pirkkala 5, all of Finland

Filed July 19, 1976, Ser. No. 706,574
Int. Cl.[2] B23Q *5/027*
U.S. Cl. 173—151 **4 Claims**



1. In a hydraulic drilling machine including a hydraulic striking apparatus, a rotatable drill rod connected to said striking apparatus at one end and having a bit at the other end, a rotary hydraulic motor for turning said rod and bit and means including a hydraulic feed motor for advancing said striking apparatus and said rod and bit in an axial direction, hydraulic pressure means including hydraulic circuit means for operating said striking apparatus and said hydraulic motor, the improvement wherein said rotary hydraulic motor and said hydraulic feed motor are connected in series in said hydraulic circuit means.

4,064,951

UNDERREAMER HAVING CUTTER ARM POSITION INDICATION

Robert W. Weber, Long Beach, Calif., assignor to The Servco Company, a division of Smith International, Inc., Gardena, Calif.

Filed Mar. 19, 1976, Ser. No. 668,622
Int. Cl.[2] E21B *47/02*
U.S. Cl. 175—45 **7 Claims**

1. An underreaming tool with combined cutter arm position indicating and cutter cleaning means comprising:

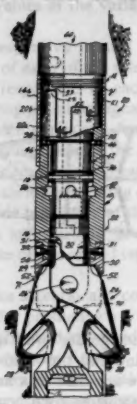
at least one elongated body portion;

at least one cutter arm pivotally mounted on said body portion and a cutter on said arm;

means for pivotally positioning said at least one cutter arm in a cutting position or a different non-cutting position; and

at least one fluid passage in said body portion comprising an input port for receipt of fluid and an output port, said output port being displaced from the cutter arm pivot in said body portion;

said cutter arm having a portion which is adjacent said body portion and substantially blocks said output port when said cutter arm is in said non-cutting position,



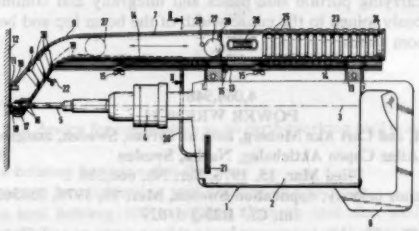
said passage adjacent and including said output port being arranged to direct fluid, passing therethrough, in the direction of said cutter when said cutter arm is in said cutting position.

4,064,952

DEVICE ATTACHABLE TO POWER DRILLS FOR REMOVAL OF MATERIAL RELEASED DURING DRILLING

Helmut Lechner, 3590 Forellenweg 1, Bad Wildungen-Wega, Germany

Filed Feb. 23, 1976, Ser. No. 660,709
Claims priority, application Germany, Feb. 28, 1975, 7506186[U]; Apr. 23, 1975, 2517926
Int. Cl.[2] E25D *17/14*
U.S. Cl. 175—209 **26 Claims**



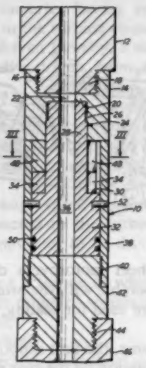
1. A device attachable to a power drill for the collection and removal of material released during drilling comprising, in combination, a collecting tube; clamp means for mounting said tube parallel to the longitudinal axis of the power drill, said power drill having a drill bit; and a spout surrounding the drill bit in proximity of the tip area of the drill bit; ball closure means forming a return closure in said spout; and locking means on said ball closure means for holding said closure means in open position.

4,064,953

SHEAR SUB FOR DRILL STRING

Kenneth L. Collins, Berwick, La., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed June 22, 1976, Ser. No. 698,328
Int. Cl.[2] E21B *41/00*
U.S. Cl. 175—321 5 Claims



1. A shear sub for installation in a drill string for drilling wells between an upper portion and a lower portion thereof comprising:

a. a tubular mandrel having a cylindrical body and a neck extending vertically from said body,

b. said tubular mandrel being connected to one of said upper portion and said lower portion of the drill string for movement unitarily therewith,

c. a cylindrical housing enclosing the body movable rotatively and limitedly longitudinally on the outer surface of the body of the tubular mandrel,

d said housing being securely connected to the portion of the drill string other than the portion to which the mandrel is connected,

e. spaced-apart lugs extending inwardly from the housing toward the neck,

f. spaced-apart splines protruding from the mandrel between the neck and the housing,

g. and shear means rupturable by torque engaging the housing and mandrel to hold the housing and mandrel in a set position with the lugs disengaged from the splines,

h. the spacing of the lugs and splines allowing movement of the lugs into spaces between the splines on shearing of the shear means.

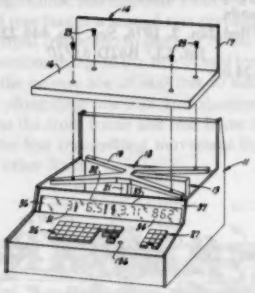
4,064,954

COMPUTING POSTAL SCALE AND METHOD WITH TARING CAPABILITY

Frank C. Rock, Santa Rosa, Calif., assignor to National Controls, Inc. Santa Rosa, Calif.

Division of Ser. No. 510,467, Sept. 30, 1974, Pat. No. 3,951,221.
This application Dec. 19, 1975, Ser. No. 642,483
Int. Cl.[2] G01G *23/22, 13/14*
U.S. Cl. 177—25 9 Claims

1. In a computing postal scale: a base, a load cell mounted on the base and adapted to provide an electrical signal corresponding to the force applied thereto, load receiving means mounted on the load cell and supported thereby, said load receiving means having an area substantially larger than the load cell for receiving objects to be posted, means responsive to the signal from the load cell for providng digital signals representative of the weight of an object received by the load receiving means, means for storing postal rate information in digital form, means for storing a signal corresponding to the weight on the load receiving means at a predetermined time, means for combining the stored signal with the signals representative of weight to effect subtraction of the weight represented by the stored signal from the weight represented by the signals representative of weight and provide a signal represen-



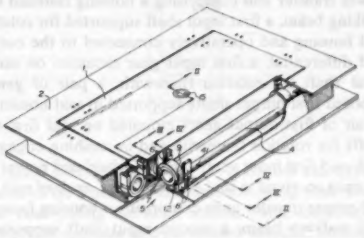
tative of net weight, and means for combining the signal representative of net weight with the rate information to provide a signal representative of the cost of sending the object.

4,064,955

VEHICLE WEIGHING SCALE

George J. Dyck, Saskatoon, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Calif.

Filed Sept. 9, 1976, Ser. No. 721,824
Int. Cl.[2] G01D *19/02*
U.S. Cl. 177—134 8 Claims



1. A scale for weighing vehicles in motion comprising:

a. a load supporting platform;

b. a fixed base structure;

c. means for interconnecting the platform with the base structure to allow vertical motion of the platform, the interconnecting means comprising at least three torque transmitting bars arranged around the perimeter of the load supporting platform, and a support and roller assembly associated with each end of each torque transmitting bar, each of said support and roller assemblies comprising first, second, third, and fourth support element pairs, the first support element pair being attached to the platform, the second and third pair being attached to horizontally opposite sides of the torque bar and the fourth pair being attached to the base structure, one of each support element pair having an upwardly facing bearing surface and the other of each pair having a downwardly facing bearing surface, and rollers disposed between adjacent upwardly and downwardly facing bearing surfaces of the first and second support element pairs, and between adjacent surfaces of the third and fourth pairs; and

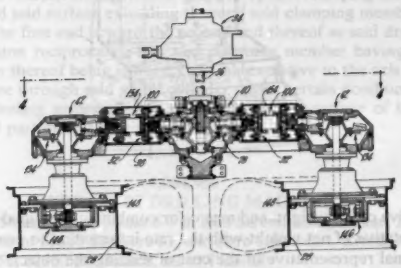
d. a load measuring device operating with low vertical travel disposed between the platform and the base structure.

4,064,956

VEHICLE DRIVE AND SUSPENSION SYSTEM

Allan J. Wildey, Lakeside, Canada, assignor to Eaton Yale Ltd., London, Canada

Filed Jan. 2, 1976, Ser. No. 646,223
Int. Cl.[2] B62D *61/10*
U.S. Cl. 180—24.05 9 Claims



1. In a vehicle having a frame, a differential unit attached to said frame;

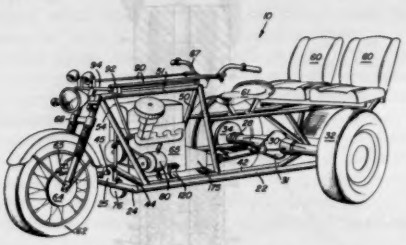
a pair of walking beams attached to said frame for rotation about an axis transverse to the longitudinal vehicle axis, each of said walking beams having a central aperture and end apertures spaced apart from said central aperture at opposite ends of said walking beam; a central power transfer unit received in said central aperture, said central power transfer unit comprising a housing fastened to said walking beam, a first input shaft supported for rotation in said housing and operatively connected to the output of said differential, a first input gear mounted on said first input shaft for rotation therewith, a pair of generally opposed first output shafts supported in said housing, and a pair of first output gears mounted on said first output shafts for rotation therewith and in meshing engagement with said first input gear; a pair of wheel end power transfer units received in said end apertures, each of said wheel end power transfer units comprising a housing fastened to said walking beam, a second input shaft supported for rotation in said housing, a second input gear mounted on said second input shaft for rotation therewith, a second output shaft supported for rotation in said housing and operatively connected to one of said drive wheels, and a second output gear mounted on said second output shaft for rotation therewith and in meshing engagement with said second input gear; trunnion bearing means attached to said central power transfer unit with the axis of said trunnion bearing means coincident with the axis of rotation of the input shaft of said central transfer units; attachment means in bearing engagement with said trunnion bearing means and attached to said vehicle frame to support said walking beam for rotation about said axis of rotation; and coupling means connected each of said pair of first output shafts of said central transfer unit with said second input shafts of said wheel end transfer units, each of said coupling means comprising a first annular member having internal gear teeth formed therein, a second annular member having internal gear teeth formed therein, and a shaft member connecting said first and second annular members, said shaft member having first and second sets of external gear teeth formed thereon for meshing engagement with said internal gear teeth, said gear teeth being cut to permit rocking movement of said shaft member within said annular members.

4,064,957

THREE-WHEEL MOTORCYCLE

Harold D. Parham, R.R. 1, White Plains, Ky. 42464

Filed June 4, 1976, Ser. No. 693,119
Int. Cl.[2] B62D *61/06*
U.S. Cl. 180—27 6 Claims



1. In a three-wheel motorcycle device having a prime mover, structure operable with the prime mover to operate the device, and structure used for seating, the improvement comprising:

a first support frame, the first support frame having an axle mounted for rotation on the rear portion thereof, a wheel being mounted on each end of the axle;

a differential mechanism mounted centrally of the axle;

a second support frame mounted for pivotal movement on the first support frame, a third wheel being mounted at the forward portion thereof, the prime mover, structure associated therewith, and seating structure being mounted on the second support frame, the major portion of the gross weight of the motorcycle device thus being carried by the second support frame;

pivotal drive transmission means connecting the prime mover to the differential mechanism for rotating the axle;

pivotal handle means mounted to the second support frame proximate to at least a portion of the seating structure for use by an operator to steer the motorcycle device; and,

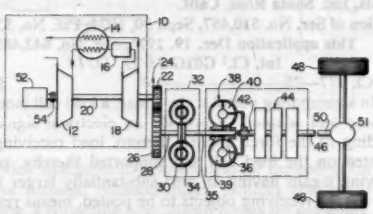
means responsive to pivotal movement of the handle means to tilt the second support frame relative to the first support frame when the motorcycle device is turned into a banking maneuver.

4,064,958

TRANSMISSION FOR SINGLE-SHAFT GAS TURBINE ENGINE

Keijiro Kinoshita, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Continuation of Ser. No. 514,915, Oct. 15, 1974, abandoned.
This application Apr. 28, 1976, Ser. No. 681,172
Claims priority, application Japan, Oct. 23, 1973, 48-119119
Int. Cl.[2] B60K *17/10*
U.S. Cl. 180—66 A 1 Claim



1. In an automobile, a single-shaft gas turbine engine having a combustor, a compressor and a turbine, a single-shaft directly connecting said compressor and said turbine;

a hydraulic coupling having an impeller element driven from said turbine and a turbine element hydraulically driven by said impeller element;

said hydraulic coupling having a slippage band comprising a range of speeds in which it slips at lower speeds of rotation of said impeller element corresponding to speeds at which said engine will stall;

a reduction gear directly connected to said single shaft and having an output shaft thereof connected to said impeller element;

a hydraulic torque converter having an impeller element connected directly to the turbine element of said hydraulic coupling to be driven thereby, a stator, and a turbine element hydraulically driven from the last-mentioned impeller element;

said hydraulic torque converter having a slippage band comprising a range of speeds in which it slips, greater than the speeds of rotation at which said hydrualic coupling slips and corresponding to speeds at which said engine will stall;

a forward-reverse change speed gearbox having an input shaft directly connected to the turbine element of said hydraulic torque converter to be driven thereby and an output shaft;

said turbine developing a torque in which said engine will not stall in an upper range of speeds of said torque converter slippage band;

at least one driving wheel;

means drivingly connecting said wheel to the output shaft of said change speed gearbox;

whereby in a range of lower speeds of rotation of the turbine said hydraulic coupling slips and in a range of speeds of rotation of said turbine higher than the last-mentioned range the hydraulic torque converter slips and said turbine is not loaded at stalling speeds thereof and is loaded only at speeds in which it develops a torque at which it will not stall.

4,064,959

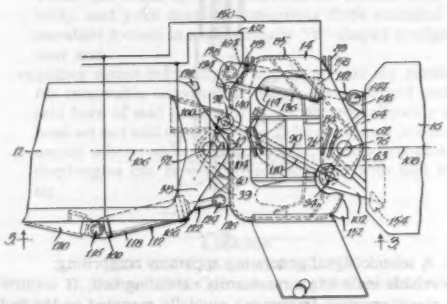
STEERING ARRANGEMENT FOR A DOUBLE ARTICULATED WHEEL TRACTOR

Robert N. Stedman, Chillicothe, and Gerald P. Simmons, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 636,502, Dec. 1, 1975, abandoned. This application Mar. 4, 1977, Ser. No. 774,335

Int. Cl.[2] B62D *5/06*

U.S. Cl. 180—139 **16 Claims**



1. A double articulated vehicle comprising: a carriage having a longitudinal axis extending from the front to the rear thereof, a rear frame having a front wall pivotally connected to said carriage along a vertical axis intersecting said longitudinal axis of the carriage, a front frame pivotally connected to said carriage along a vertical axis intersecting said longitudinal axis of the carriage, a link connected to the rear frame for pivotal movement about a vertical axis located on one side of said longitudinal axis, said link being connected to the front frame for pivotal movement about a vertical axis located on the opposite side of said longitudinal axis, a first ram pivotally connected to the rear frame rearward of the front wall and to the rear of the carriage with both said connections being on the side of said longitudinal axis opposite from the connection of said link to said rear frame, a second ram pivotally mounted to the rear of the front frame and to the rear of the carriage with both said connections being on the side of said longitudinal axis opposite from the connection of said link to said front frame, and means for elongating one ram and shortening the other ram to articulate the front frame and rear frame relative to the carriage with the link transmitting movement from one frame directly to the other frame.

4,064,960

NOISE BARRIER

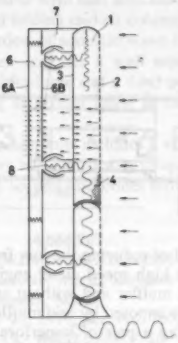
Norio Murakami, Kawasaki, Japan, assignor to Showa Koji K.K., Kawasaki, Japan

Filed Apr. 23, 1976, Ser. No. 679,713

Claims priority, application Japan, Aug. 27, 1975, 50-102887; Dec. 23, 1975, 50-152848; Dec. 27, 1975, 51-176324; Jan. 12, 1976, 51-2148

Int. Cl.[2] G10K *11/00*

U.S. Cl. 181—210 **13 Claims**



1. A noise barrier comprising (1) a hollow cell type block composed of (a) a perforated sound-absorbing plate falling on the side confronting the noise source, (b) a sound-insulating plate disposed opposite said perforated sound-absorbing plate, (c) partition plates disposed between said two plates so as to divide the intervening space between said two plates into a plurality of cavities and (d) a sound-absorbing material placed to fill said cavities, (2) a free spacing plate disposed parallel to said sound-insulating plate and across a space therefrom so as to enclose a free air layer in conjunction with said sound-insulating plate and (3) vibration-repressing means coupling said hollow cell type block and said free spacing plate.

4,064,961

SLANTED CAVITY RESONATOR

Gudin Tseo, San Diego, Calif., assignor to Rohr Industries, Incorporated, Chula Vista, Calif.

Filed Apr. 5, 1976, Ser. No. 673,398

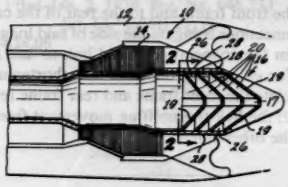
Int. Cl.[2] G10K *11/04*; F02K *1/26*; B64D *33/06*

U.S. Cl. 181—213 **9 Claims**

1. A combination engine plug and muffler for a fan jet aircraft engine comprising:

a central plug structure formed of a plurality of inward slanting, spaced apart elements, said elements fixedly attached to a center member positioned co-axial with the center line of said engine and fixedly attached thereto, said spaced apart elements forming outwardly open and in-

wardly terminating cavities therebetween and pervious material attached to the outer periphery of said elements



for covering the spaces between said spaced apart elements.

4,064,962

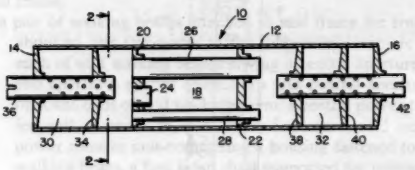
MUFFLER METHOD AND APPARATUS

Raymon E. Hunt, Longview, Tex., assignor to Garlock Inc.

Continuation of Ser. No. 436,149, Jan. 24, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 622,039

Int. Cl.[2] F01N *1/08*

U.S. Cl. 181—272 **27 Claims**



1. The method of reducing the low frequency exhaust noise of a high output high speed diesel engine without increasing the volume of a muffler and without substantially increasing the back pressure imposed by said muffler on the engine, comprising positioning a pair of imperforate spaced-apart baffle plates in said muffler to define a low frequency resonator chamber therebetween, providing a tuning tube through that one of said baffle plates closest to an inlet end of said muffler, said tuning tube being imperforate in said chamber and having an inlet opening thereinto in a first chamber immediately upstream from said low frequency resonator chamber and having an outlet opening therefrom in said low frequency resonator chamber, carrying a portion of the entire downstream net exhaust gas flow through said low frequency resonator chamber through each of a plurality of longitudinal transfer tubes, that are imperforate in said chamber, extend between said pair of baffle plates, have an inlet opening thereinto in a chamber upstream from said low frequency resonator chamber and have an outlet opening therefrom in a chamber downstream from said low frequency resonator chamber, and carrying exhaust gas directly downstream from said downstream chamber.

4,064,963

EXHAUST FOR INTERNAL-COMBUSTION ENGINE

Peter Kaan, Vienna, and Gunther Rudolf Beke, Kammersdorf, both of Austria, assignors to Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft, Braunau am Inn, Ranshofen, Austria

Filed May 28, 1976, Ser. No. 691,148

Claims priority, application Austria, May 30, 1975, 4107/75

Int. Cl.[2] F01N *7/16, 1/08*

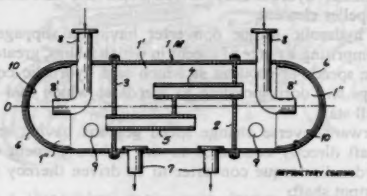
U.S. Cl. 181—244 **10 Claims**

1. An exhaust for an internal-combustion engine, comprising:

a muffler of a corrosion-resistant malleable metallic material consisting essentially of aluminum, said muffler having a body with a generally cylindrical peripheral wall and a pair of end caps adjoining said wall, at least said end caps being provided with a protective inner layer of heat-resistant material;

two transverse partitions dividing the interior of said body into two outer compartments bounded by said end caps and a central compartment between said partitions;

a pair of nonaligned, substantially axially extending tubular elements each traversing one of said partitions for establishing communication between said central compartment and a respective outer compartment;



a pair of inlet pipes extending substantially radially through said wall into said outer compartments for admitting hot exhaust gases into said muffler, said pipes terminating in bent extremities open toward said end caps whereby the incoming exhaust gases impinge upon said protective layer; and

outlet means in said wall between said partitions for discharging the exhaust gases from said muffler.

4,064,964

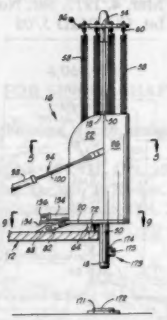
SEISMIC SIGNAL GENERATING APPARATUS

John A. E. Norden, 709 Normandie Drive, Norman, Okla. 73069

Filed July 12, 1976, Ser. No. 704,174

Int. Cl.[2] G01V *1/14*

U.S. Cl. 181—114 **19 Claims**



1. A seismic signal generating apparatus comprising:

a vehicle including a rearwardly extending bed;

a ram-supporting framework pivotally mounted on the bed for pivotation about a horizontal axis;

a ram reciprocably mounted in the framework for vertical reciprocation in one position of the framework;

a plurality of catapult tension springs connected between the framework and the upper end of the ram for forcibly reciprocating the ram from an elevated status in which the catapult springs are tensioned, to a lowered, impacting position in which the springs are tensioned to a lesser degree; and

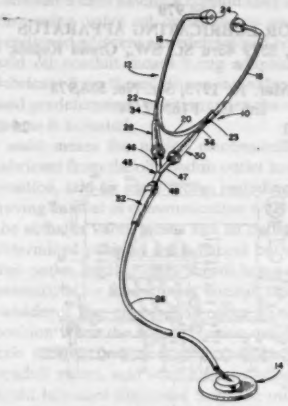
a pair of superimposed metallic striker plates positioned directly below the ram upon the ground.

4,064,965

STETHOSCOPE

Alberta Mae Brown, 1241 W. 53rd St., Los Angeles, Calif. 90037

Filed Mar. 11, 1976, Ser. No. 666,178
Int. Cl.[2] A61B 7/02
U.S. Cl. 181—131 3 Claims



1. In combination with a stethoscope of the type including a head set and a sound-pick-up diaphragm used to detect sounds produced in the body, the improvement comprises:

a plurality of removable connector plugs wherein at least two of said plugs are secured to the head set, and wherein at least one of said plugs is attached to sound-pick-up diaphragm, each of said plugs having a central bore disposed therein for communication therethrough, and between said head set and said sound-pick-up diaphragm, each of said connector plugs including an extended, flexible, tubular member affixed to one end thereof for permanent attachment of the respective head set and sound-pick-up diaphragm, and wherein an enlarged, tapered opening is arranged in the opposite ends of said plugs;

an integrally formed, tubular, yoke member having interconnecting passages disposed therein, said yoke being formed to be removably coupled to each of said plugs, whereby sound is transmitted from said diaphragm to said head set when said diaphragm is positioned for contact with the body, said yoke member comprising three extended leg members formed in a substantially "Y"-shaped configuration; and

engaging means integrally formed about said leg members for removable engagement within said enlarged end of said bore of said connector plugs, thereby allowing said head set and said sound pick-up to be connected or disconnected when required, and wherein other sound-pick-up diaphragms can be readily interchanged with said head set.

4,064,966

LOUDSPEAKER APPARATUS

William D. Burton, 2946 Gertrude Ave., La Crescenta, Calif. 91214

Filed Mar. 11, 1976, Ser. No. 666,006
Int. Cl.[2] H05K 5/00
U.S. Cl. 181—144 2 Claims

1. A loudspeaker apparatus comprising:

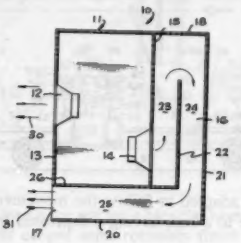
an enclosure having an internal sound chamber;

at least a pair of loudspeaker units secured in said sound chamber in fixed spaced apart relationship, each of said loudspeaker units facing in opposite directions in back-to-back relationship;

an air column carried in said enclosure having one end terminating adjacent the front of a selected one of said loudspeaker units and the other end terminating in close proximity to said other loudspeaker unit and having a length so that acoustic wave energy radiation from said other loudspeaker unit and from said air column is additive over a predetermined frequency range;

said air column is folded over upon itself so as to reverse the radiation direction of acoustic wave energy radiating from said selected loudspeaker unit;

a partition fixly carried in said enclosure having opposite wall surfaces defining a portion of said air column;



said partition associated with said selected loudspeaker unit for elongating and folding said air column so as to achieve said reverse direction of acoustic wave energy radiation;

said partition further includes a wall separating adjacent portions of said air column and a third portion of said air column extending at a right angle to said adjacent portions;

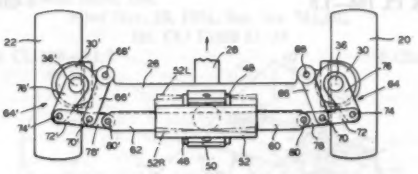
each of said loudspeaker units includes a vibrating cone and wherein said cones are electrically coupled in an out-of-phase relationship so that said cones move in unison.

4,064,967

STEERING MECHANISM

Mac R. Doolittle, Charlotte, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed July 23, 1976, Ser. No. 707,961
Int. Cl.[2] B62D 5/10, 7/10
U.S. Cl. 180—155 20 Claims



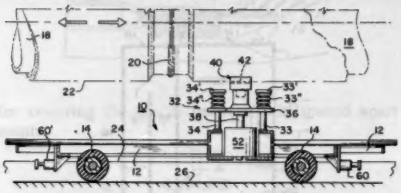
1. A steering mechanism for wheeled vehicles having right and left steer wheels comprising a modified four-bar steer linkage operatively connected to each said wheel, and tie rod means connected to both said four-bar linkages for actuating said linkages and wheels to steer the vehicle in either direction, each of said linkages comprising an intermediate steering link, a steering arm connected at one end pivotably to said link, pivot means connected rigidly to the opposite end of said steering arm and connected to the adjacent wheel for steering the wheel, a guide link connected at one end pivotably to said intermediate link and a relatively fixed member to which the opposite end of said guide link is pivotably connected, said intermediate link including a rigid extension which extends a predetermined distance inwardly beyond the connection thereto of said guide link, said tie rod means being connected pivotably at each end thereof to an adjacent inner end of the rigid extension of the respective intermediate link.

4,064,968

SCAFFOLD FOR WORKING ON A PIPELINE MOVABLE RELATIVE TO A BASE

William B. Cook, Jr., Orange, Calif., assignor to Santa Fe International Corporation, Orange, Calif.

Filed May 20, 1976, Ser. No. 687,980
Int. Cl.[2] E04G 3/16
U.S. Cl. 182—13 2 Claims



1. A scaffold adapted to follow the movements of a coated pipeline relative to a base having a depressed trackway, comprising:

a platform supported on a pair of spaced cylindrical rollers having their longitudinal axes transverse to the center line of the scaffold, said trackway limiting the lateral movements of said rollers;

a fluid-operated system including extensible means movable between said platform and said pipeline;

a flexible pipe support member carried by said extensible means for frictionally engaging said pipeline, said member having an arcuate surface adapted to engage the coating of the pipeline and being adapted to allow relative movements between said member and said pipeline; and

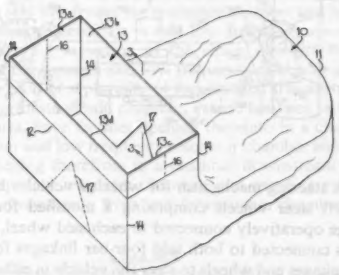
said system including operating means for selectively moving said extensible means with said pipe support member into and out of frictional engagement with said pipeline.

4,064,969

OIL DRAIN BAG

Charles A. Black, 777 S. Lawrence St., Montgomery, Ala. 36101

Filed Nov. 4, 1976, Ser. No. 738,833
Int. Cl.[2] F16N 33/00
U.S. Cl. 184—1.5 3 Claims



1. In a container adapted to rest on a support beneath a spout, hole or the like to receive liquid therefrom,

a. an elongated, flexible, sack-like body having a mouth and being of a size to contain a predetermined amount of liquid,

b. a flat-foldable insert of substantially rigid material permanently attached to the inside of the mouth of the sack adjacent the upper end of the sack and extending into the sack a minor length of the body of the sack, said insert when unfolded forming a rigid column which holds the sack mouth open and holds the mouth of the sack above the level of the major length of the sack when the sack rests on a substantially flat surface, and

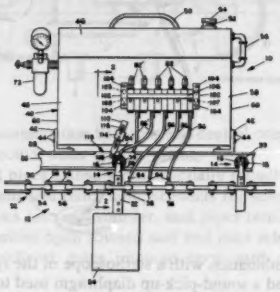
c. the lower edge of the insert being unconnected to the sack body thereby forming a passage through which liquid may pass from the unfolded insert into the sack.

4,064,970

CONVEYOR LUBRICATING APPARATUS

Gordon P. Reeves, 2519 43rd St., SW., Grand Rapids, Mich. 49509

Filed Mar. 10, 1975, Ser. No. 556,973
Int. Cl.[2] F16N 7/34
U.S. Cl. 184—15 B 26 Claims



1. Conveyor lubricating means for lubricating moving parts of a conveyor mechanism wherein a series of interconnected wheeled trolleys ride along a track, said lubricating means comprising:

oil supply means for supplying liquid lubricant to the lubricating means;

actuator valve means for controlling the flow of pressurized air to the lubricating means, said actuator valve means having inlet means for receiving air from an air supply means and outlet means for delivering air from the actuator means to the lubricating means, said actuator valve means having an open position wherein air is permitted to flow to the lubricating means and a closed position wherein the flow of air to the lubricating means is blocked;

oil dispensing valve means having air inlet means for receiving pressurized air from the outlet means of the actuator valve means, oil inlet means for receiving liquid lubricant from the outlet of the oil supply means, and oil outlet means for delivering liquid lubricant from the oil dispensing valve means, said oil dispensing valve means being actuated by the receipt of pressurized air through the air inlet means and being adapted to discharge a predetermined quantity of liquid lubricant from the oil outlet means each time the oil dispensing valve is actuated, said oil dispensing means being actuated only once each time the actuator valve means is opened and delivering the same predetermined quantity of liquid lubricant from the oil outlet means regardless of the amount of time the actuator valve remains open before closing, said oil dispensing valve means comprising a hollow housing including an oil chamber of predetermined volume and an air driven plunger slidably mounted in the housing for reciprocation into and out of the oil chamber, the plunger having a predetermined stroke into the oil chamber, the oil inlet and outlet means being formed in the oil chamber, with the oil outlet means including means to prevent liquid lubricant from being drawn back into the oil chamber when the plunger is withdrawn from the oil chamber, said air inlet means being formed in an air chamber adjacent the end of the plunger facing away from the oil chamber such that the introduction of pressurized air into

the air inlet means drives the piston into the oil chamber and causes the ejection of a predetermined quantity of liquid lubricant from the oil outlet means, said oil dispensing valve means including resilient biasing means for urging the plunger out of the oil chamber when the air pressure in the air chamber is relieved;

oil conduit means having a conduit inlet connected to the oil dispensing valve oil outlet means and a conduit outlet positioned adjacent a predetermined position on the track, said oil conduit means being adapted to convey liquid lubricant from the oil dispensing valve oil outlet means to said predetermined position when the oil dispensing valve means is actuated;

air assist means for urging mechanically dispensed liquid lubricant from the oil conduit outlet to said predetermined position, said air assist means including air conduit means having an inlet in communication with the outlet means of the actuator valve means and an outlet adjacent said predetermined position and adjacent but not in said oil conduit outlet, said air assist means being adapted to convey pressurized air from the air conduit outlet means over the outside of the oil conduit outlet to said predetermined position when the actuator valve means is open;

nozzle means connected to the outlets of the air and oil conduit means, said nozzle means being formed such that liquid lubricant dispensed from the outlet of the oil conduit is entrained in the air leaving the outlet of the air conduit and urged from the nozzle means to said predetermined position; and

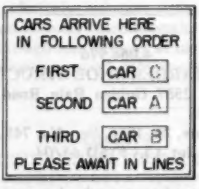
actuating means for temporarily opening the actuator valve means each time a part to be lubricated reaches said predetermined position on the track such that liquid lubricant discharged from the nozzle means is deposited on the part.

4,064,971

ELEVATOR SERVICE INFORMATION APPARATUS

Tatsuo Iwasaka; Takashi Kaneko, both of Katsuta, and Seiichi Shimazaki, Kamagaya, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 3, 1976, Ser. No. 682,343
Claims priority, application Japan, May 12, 1975, 50-54538
Int. Cl.[2] B66B *3/00*
U.S. Cl. 187—29 R **9 Claims**



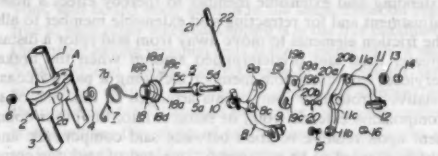
1. A service information apparatus for an elevator system including a plurality of elevator cars installed in juxtaposition for serving a plurality of floors and means for detecting positions of said cars, comprising means for predicting an order in which the elevator cars arrive at a predetermined floor from position signals delivered from said position detecting means, and means for giving information about the predicted arrival order of the elevator cars at the predetermined floor.

4,064,972

CALIPER BRAKE FOR BICYCLES FOR MAINTAINING EQUAL DISTANCE BETWEEN BOTH BRAKE SHOES AND A WHEEL THEREBETWEEN

Kiyoshi Ohtani, Ageo, and Kikuzo Takamiya, Kitamoto, both of Japan, assignors to Bridgestone Cycle Co. Ltd., Tokyo, Japan

Filed Dec. 2, 1976, Ser. No. 746,870
Claims priority, application Japan, July 12, 1976, 51-81955
Int. Cl.[2] B62L *3/00*
U.S. Cl. 188—24 **11 Claims**



1. a caliper brake for use on a bicycle, comprising:

left and right caliper arms rotatably fitted to a pivot shaft and having at their ends brake shoes adapted to be urged against a rim of a wheel of a bicycle,

a rocking arm having a base portion, for pivotally mounting to a frame of a bicycle, between said caliper arms on said pivot shaft in a semi-fixed condition, the rocking arm having at its end a through-hole, opposite to which the left and right caliper arms each have bottomed holes, and

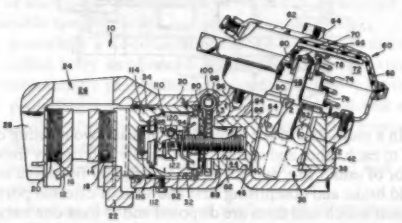
a universal joint lever having at its middle portion a midle protrusive ball portion and at each end an end protrusive ball portion, said middle protrusive ball portion fitting in said through-hole of the rocking arm and said end protrusive ball portions fitting in said bottom holes of the left and right caliper arms, respectively, for maintaining the distance of free gaps between left and right brake shoes and a bicycle wheel rim always substantially equal.

4,064,973

ACTUATING AND ADJUSTING MECHANISM FOR DISC BRAKES

Brian Charles Deem; Matthew Edward Markert, and Bruce Earl Latvala, all of Elyria, Ohio, assignors to The Bendix Corporation, South Bend, Ind.

Filed Nov. 18, 1976, Ser. No. 742,802
Int. Cl.[2] F16D *65/38*
U.S. Cl. 188—71.7 **9 Claims**



1. In a disc brake, a rotor having a pair of friction faces, a pair of friction elements disposed adjacent each of said friction faces, a torque member mounted adjacent said rotor, a caliper slidably mounted on said torque member and straddling said rotor for urging said friction elements into frictional engagement with said friction faces when a brake application is effected, said caliper including a housing, actuating means carried by said housing, said actuating means including an extensible force-transmitting member slidably mounted in said housing and movable therein in a direction generally parallel to the axis of rotation of the rotor, one end of said extensible member

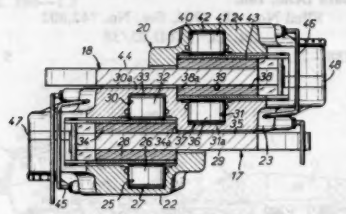
being adapted to operably engage one of said friction elements for transmitting brake actuation forces to the latter when a brake application is effected and to limit retraction of the one friction element when the brake is released, means engaging the other end of said member for urging the latter toward the rotor when a brake application is effected, automatic adjustment means responsive to movement of said extensible member in excess of a predetermined amount to extend said extensible member and thereby limit retraction of said friction element to said predetermined amount, and manual adjustment means for extending said extensible member to thereby effect a manual adjustment and for retracting said extensible member to allow the friction elements to move away from said rotor a distance greater than said predetermined amount when the brake is serviced, said extensible member including a pair of coaxial, relatively rotatable components arranged so that one of said components extends from, or retracts into, the other component upon relative rotation between said components, and a piston adapted to be engaged by one end of said one component to provide a force transmitting back to one of said friction elements when a brake application is effected, said automatic adjustment means including a ratchet mechanism carried by said one component and by said piston for effecting rotation of the one component in a direction extending it from the other component when an automatic adjustment of said brake is effected, said manual adjustment means including gearing means for rotating said other component upon rotation of the gearing means, and means frictionally engaging the wall of said housing and engaging said one component, said frictionally engaging means yielding when the force applied to the manual adjusting means attains a level sufficient to overcome the frictionally engaging force between the housing and the frictionally engaging means to prevent damage to the manual adjusting means.

4,064,974

ACTUATOR MOUNTING ASSEMBLY FOR A MULTI-DISC BRAKE

Rene Filderman, Asnieres, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed June 8, 1976, Ser. No. 694,015
Claims priority, application France, June 13, 1975, 75.18525
Int. Cl.[2] F16D 55/36
U.S. Cl. 188—71.3 **8 Claims**



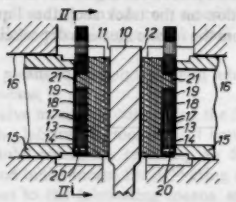
1. In a multi-disc brake comprising at least two rotating discs fixed to each other and spaced apart axially and rigidly fixed on a rotor of said brake, and stirrup means rigidly fixed to a stator of said brake and comprising first and second external portions between which said discs are disposed and at least one intermediate portion disposed between said discs, each said external portion having at least one cylinder and piston assembly for applying a friction lining means associated therewith axially against an adjacent said disc, said at least one intermediate portion therefor insuring at least one pair of cylinder and piston assemblies oriented in opposite axial directions from said at least one intermediate portion to apply friction lining means associated therewith against said discs on opposite sides of said at least one intermediate portion, said cylinder and piston assemblies of said at least one intermediate portion being circumferentially staggered and said cylinders being blind and each extending axially over a depth close to the thickness of said at least one intermediate portion; the improvement in which said first and second external stirrup portions and said at least one intermediate stirrup portion are constituted by separate members, and means releasably fixing together all said stirrup portions in an angular sector of about 180° about the axis of said rotor, said fixing means being disposed in three groups spaced apart peripherally about said discs and disposed substantially at the corners of a triangle, a first of said corner groups of said fixing means being disposed at one end of said first external portion and at one end of said intermediate portion, a second of said corner groups of said fixing means being disposed at one end of said second external portion and at the other end of said at least one intermediate portion, and a third of said corner groups of said fixing means being disposed at the other ends of said first and second external portions and substantially at a central zone of said at least one intermediate portion.

4,064,975

LAMINATED NOISE-PREVENTING SUPPORT FOR THE FRICTION LINING OF A BRAKE SHOE

Rene Gabriel Filderman, Asnieres, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Aug. 3, 1976, Ser. No. 711,352
Claims priority, application France, Sept. 12, 1975, 75.27991
The portion of the term of this patent subsequent to Jan. 29, 1993, has been disclaimed.
Int. Cl.[2] F16D 65/04
U.S. Cl. 188—73.5 **10 Claims**



1. A noise-prevention support for a friction lining of a braking member in which the lining is fixed to said support and is adapted to be applied against a friction track by the effect of a force applied to said support over a contact area by force-applying means, said support comprising a stack of a plurality of wholly metallic sheets contiguous to each other over their entire surface and assembled together by localized assembly means, at least part of said assembly means being formed over said contact area by which the force-applying means applies force to said support.

4,064,976

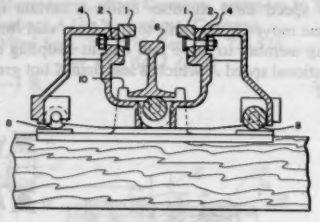
CAR RETARDER SHOE STRUCTURE

Westley C. Muller, 2557 Golden Rain Road No. 7, Walnut Creek, Calif. 94595

Filed Nov. 26, 1976, Ser. No. 745,282
Int. Cl.[2] F16D 65/04
U.S. Cl. 188—234 **10 Claims**

1. In a car retarder wherein a wheel-engaging shoe member is detachably mounted on a support member by fastening means and includes a protruding rib having a wheel-engaging surface, the improvement comprising the shoe member having a tapered hole therethrough, said hole being proximate to said protruding rib, and fastening means comprising a bolt disposed in said hole, said bolt having an exposed head at one end thereof and a tapered shank portion adjacent said head, the taper of said shank portion conforming substantially to the taper of said hole, said bolt head protruding from and being

outwardly spaced from said hole said exposed and protruding head being shaped to contact said protruding rib in said shoe



member to prevent rotation of said bolt when disposed in said hole.

4,064,977

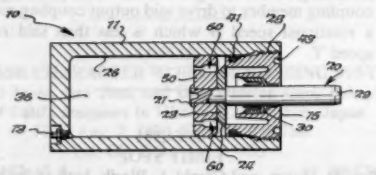
FLUID AMPLIFIED SHOCK ABSORBER HAVING DELAVAL NOZZLE

Douglas P. Taylor, Grand Island, N.Y., assignor to Tayco Development, Inc., North Tonawanda, N.Y.

Continuation of Ser. No. 616,800, Sept. 25, 1975, abandoned, which is a continuation of Ser. No. 520,939, Nov. 4, 1974, abandoned, which is a continuation of Ser. No. 399,165, Sept. 20, 1973, abandoned, which is a continuation of Ser. No. 225,570, Feb. 11, 1972, abandoned. This application Apr. 25, 1977, Ser. No. 790,439

Int. Cl.[2] F16F *9/19, 9/34*

U.S. Cl. 188—317 **6 Claims**



1. A shock absorber comprising:

a housing means charged with a compressible fluid;

sweeping means slidably disposed within said housing for traversing said housing means, said sweeping means separating said housing means into at least two chambers; and

at least one DeLaval nozzle-shaped fluid passage disposed in said sweeping means and providing the exclusive means for the flow of fluid between said separated chambers formed in said housing means, said passage being configured to accommodate the flow of said compressible fluid at velocities approaching Mach 0.6 and greater and to produce a relatively constant resistance force with increasing fluid velocity therethrough, whereby the flow of said fluid through said passage at said velocities provides fluid amplification upon movement of said sweeping means.

4,064,978

ARRANGEMENT AND METHOD OF DRUM BRAKE SPRING ATTACHMENT

Langley H. Wunderlich, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1976, Ser. No. 745,552

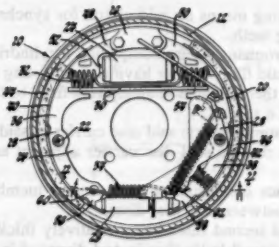
Int. Cl.[2] F16D *65/00*

U.S. Cl. 188—331 **2 Claims**

1. In a drum brake assembly having a pair of brake shoe assemblies with adjacent ends thereof separated by adjustable spacing means, and tension spring means attached to said shoe assemblies and acting substantially parallel to said adjustable spacing means to hold said shoe assembly ends and said adjustable spacing means in operating relation, the improvement in which:

each of said shoe assemblies has a web section with a spring-receiving aperture therethrough adjacent said shoe assembly ends;

said spring means is a coil tension spring having an axially extending coiled body section and transversely extending opposite end sections formed to provide V-shaped end hooks extending generally perpendicularly with respect to the axis of said coiled body section and transversely beyond said coiled body section in the same direction relative to each other when said spring is in the free condition, the spring having terminal ends at the extreme ends of said V-shaped end hooks located transversely beyond said coiled body sections, said terminal ends being shorter than the portions of the V-shaped end hooks joining said coiled body section, the width of said V-shaped ends hooks at said spring terminal ends being greater than the width of said apertures and the apexes thereof being of substantially less width than the width of said apertures, said V-shaped end hooks being flexible to permit insertion thereof through said apertures with said coiled body section being in tension and when said terminal ends pass through and beyond said apertures, said terminal ends springing back toward their free positions to hook on said webs on the opposite sides thereof from said spring coiled body section and retaining said spring means on said shoe assembly



webs with the tension in said coiled body section holding said shoe assembly in operating relation with said adjustable spacing means.

2. The method of installing an adjustable spacing means holding spring having V-shaped end hooks in apertures in a pair of shoe webs of adjacent brake shoe ends connected by an adjustable spacing means comprising the steps of:

a. providing a coiled spring having an axially extending coiled body section and V-shaped end hooks extending substantially perpendicular to said coiled body section;

b. providing a pair of axially parallel notched end shafts capable of relative spreading movement and of concurrent axial movements;

c. engaging the notches of the pair of notched end shafts with the V-shaped end hooks;

d. spreading the notched end shafts apart along the spring axis to tension the spring and align the V-shaped end hooks and shafts with the apertures;

e. moving the shafts axially and concurrently toward said apertures and inserting the end hooks and shafts through the apertures by such movement while yieldably closing the V-shaped end hooks as necessary to pass the end hooks through the apertures until the end hook terminal ends pass through and beyond the apertures;

f. springing the end hook terminal ends back to their free positions so that they hook on the shoe assemblies beyond the apertures;

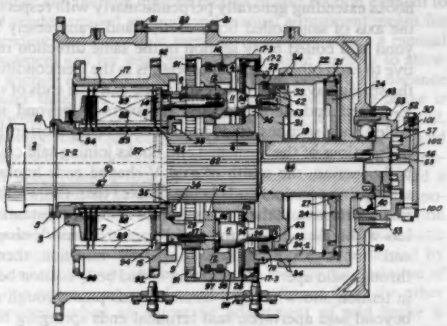
g. and axially withdrawing the notched end shafts.

4,064,979

SYNCHRONIZING CLUTCH

John H. Crankshaw, Erie, Pa., assignor to Dynetics, Inc., Erie, Pa.

Continuation-in-part of Ser. No. 639,910, Dec. 11, 1975. This application Aug. 17, 1976, Ser. No. 715,047
Int. Cl.[2] F16D 23/06
U.S. Cl. 192—53 F 19 Claims



1. A synchronizing clutch comprising,
a first member including a first coupling teeth,
a second member including a second coupling teeth adapted to be moved into engagement with said first coupling teeth,
synchronizing means on said clutch for synchronizing said coupling teeth,
said synchronizing means comprising a cylindrical disc carrier on said first member having an adjusting ring fixed to one end thereof and a retaining ring fixed to the other end defining a space,
first discs supported on said disc carrier in said space,
a pressure ring on said disc carrier adjacent said retaining ring,
second discs connected to said second member and supported between said first discs,
one of said second discs being relatively thick and having kidney-shaped holes therein and disposed in engagement said with said pressure ring,
and drive pins extending through said pressure ring and adapted to engage said holes in said relatively thick disc when said first member and said second member are synchronized with each other,
said pressure ring constituting a positive locating means for said relatively thick disc relative to said drive pins whereby the position of said pins relative to said relatively thick disc is determined.

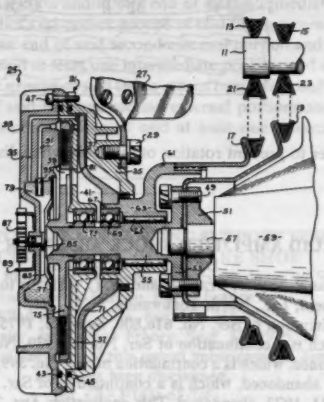
4,064,980

DUAL SPEED VISCOUS FLUID COUPLING

Thomas H. Tinholt, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 12, 1976, Ser. No. 731,263
Int. Cl.[2] F16D 35/00, 43/25
U.S. Cl. 192—58 B 11 Claims

1. A viscous fluid coupling adapted to be driven by a prime mover, the fluid coupling comprising:
a. an output coupling member rotatable about an axis and defining a low speed fluid chamber and a high speed fluid chamber;
b. a first input coupling member rotatably disposed within said low speed fluid chamber;
c. a second input coupling member rotatably disposed within said high speed fluid chamber;
d. means for transmitting a given motion of the prime mover into a rotational speed X of said first input coupling member and into a rotational speed Y of said second input coupling member, said rotational speed X being greater than said rotational speed Y for any given motion of the prime mover;
e. first means for providing a quantity of viscous fluid in said low speed fluid chamber below a certain speed of the prime mover to transmit torque from said first input coupling member to drive said output coupling member at a rotational speed A which is less than X but greater than Y; and



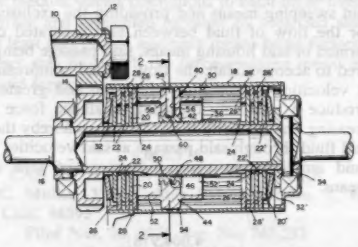
f. second means for providing a quantity of viscous fluid in said high speed fluid chamber above said certain speed of the prime mover to transmit torque from said second input coupling member to drive said output coupling member at a rotational speed B which is less than said rotational speed Y.

4,064,981

LIMIT STOP

William H. House, and Gerald A. Pierik, both of Palos Verdes Peninsula, Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Feb. 24, 1975, Ser. No. 552,840
Int. Cl.[2] F16D 71/00
U.S. Cl. 192—141 7 Claims



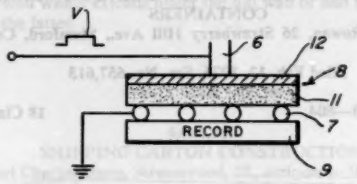
1. Limit stop apparatus for a rotating shaft, said apparatus comprising first jackscrew means including a rotating shaft and a first travelling member, second jackscrew means including said first travelling member, a second travelling member, means for preventing rotation of said second travelling member, stop means for energizing said second travelling member, and means for permitting limited relative motion between said first and second travelling members for stopping rotation of said shaft in one direction and releasing said shaft upon rotation in another direction.

4,064,982

PRINTING RIBBON

Rainer Anton, Nuremberg; Ernst Beyer, Hannover, and Bodo Bielefeld, Hemmingen, all of Germany, assignors to Triumph Werke Nurnberg A.G., Nuremberg, Germany

Filed Sept. 20, 1976, Ser. No. 724,526
Int. Cl.[2] B41J *31/05*
U.S. Cl. 197—1 R 5 Claims



1. A printing ribbon adapted to be placed between a writing electrode and a permeable counterelectrode for transferring marking material thereof to a record adjacent the outer side of said counterelectrode on experiencing multiple dielectric breakdowns in response to voltages applied directly across said writing and counter-electrodes,

said ribbon comprising a discrete continuous layer of dielectric material having a predetermined breakdown voltage of lesser magnitude than the voltage applied across said writing and permeable counterelectrodes,

pigments within said layer,

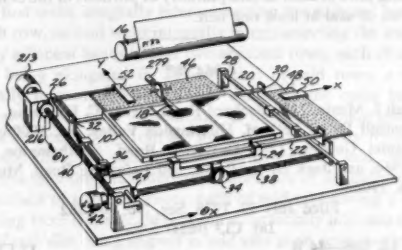
said pigmented layer constituting said marking material.

4,064,983

JAPANESE CHARACTER WORD PROCESSING SYSTEM

Fumiyuki Inose, San Jose, and Don Winston Geri, Palo Alto, both of Calif., assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 710,716
Int. Cl.[2] B41J *1/02, 3/50*
U.S. Cl. 197—1 A 16 Claims



1. An automatic word processing printer system for use with a large number of characters comprising:

a movable font storage means for storing individual font characters;

support means for movably mounting the storage means including an X-directional guideway and a Y-directional guideway, said X-directional guideway movably supporting said font storage means and said Y-directional guideway movably supporting said X-directional guideway and said font storage means;

a hammer assembly for receiving a font from the storage means and impacting it against an appropriate medium;

first motor means for driving the font storage means along the X axis and Y axis guideways relative to the hammer assembly;

control means for driving the first motor means to a predetermined font character;

monitor means for generating a hammer fire signal when the predetermined font character is aligned with the hammer assembly;

second motor means for actuating the hammer assembly when a hammer fire signal is generated;

first encoder means for generating an X direction positional signal of an individual font character; and

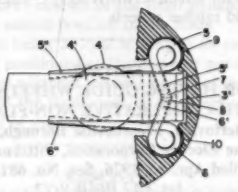
second encoder means for generating a Y direction positional signal of said individual font character, said first and second encoder means comprise one encoder plate member and a sensor member mounted adjacent the encoder plate member, the encoder plate member of said first encoder means is mounted to said font storage means for movement therewith, and wherein the sensor member of said first encoder means is mounted to said Y-directional guideway for movement therealong.

4,064,984

FASTENING DEVICE FOR PRINT HEAD

Thurston H. Toeppen, R.D. 3 - Lois Lane, Poughkeepsie, N.Y. 12603

Filed Oct. 12, 1976, Ser. No. 731,718
Int. Cl.[2] B41J *1/60*
U.S. Cl. 197—52 6 Claims



1. A releasable fastening device for fastening a unitary print head to a projecting mounting post provided with first indexing means, an abutment surface and a circumferential groove comprising:

said print head having a plurality of type characters embossed on its periphery and an axial hole formed therein for slidable positioning on said mounting post;

second indexing means formed on said head to mate with said first indexing means on said mounting post for predetermined relative angular positioning of said print head with respect to said mounting post;

an annular shoulder formed on said print head to mate with said abutment surface of said mounting post to limit the axial position of said print head in a first direction;

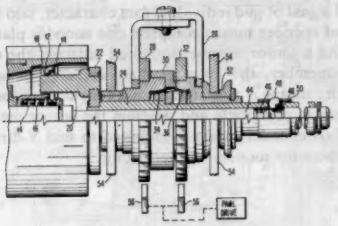
manually-controllable locking means operatively associated with said print head for cooperating with said circumferential groove in said mounting post to limit the axial position of said print head in a second direction, comprising locking members in the form of one or more bent levers, each of said bent levers being capable of pivotal movement between an unlocked position out of said groove in which each of said bent levers is unstressed, and a locked position in which each of said bent levers is deflected into a stressed position within said groove, and control lever means capable of pivotal movement between corresponding unlocked and locked positions, said control lever means being provided with journal bearing means intersecting its effective pivot axis at an acute angle for moving said locking means between the unlocked and the locked positions.

4,064,985

SELECTABLE DUAL RATCHET FEED FOR A PRINTER PLATEN

William Harold Castle, Winchester; William Ray Crowe, and James Lester Herriford, both of Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 1, 1976, Ser. No. 691,943
Int. Cl.² B41J *19/32*
U.S. Cl. 197—114 R **2 Claims**



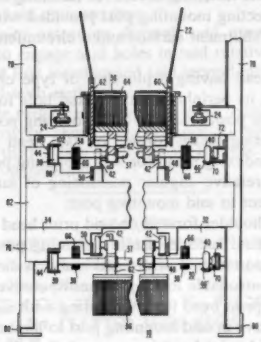
1. A line feed control for a printer platen comprising:
a rotatable and axially moveable sleeve;
a pair of dissimilar pitch ratchet wheels freely rotatably mounted on said sleeve, said sleeve shiftable axially with respect to said ratchet wheels;
means to separate said ratchet wheels by a fixed distance;
engaging means fixedly attached to said sleeve and shiftable therewith for selectively drivingly engaging said sleeve to one of said ratchet wheels.

4,064,986

ESCALATOR HAVING GUIDE WHEELS AND GUIDE TRACK WITH COOPERATIVE NON-FLAT SURFACES

Matthew G. Bertovich, Monroeville Borough, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 30, 1976, Ser. No. 681,963
Int. Cl.² B66B *9/12*
U.S. Cl. 198—326 **16 Claims**



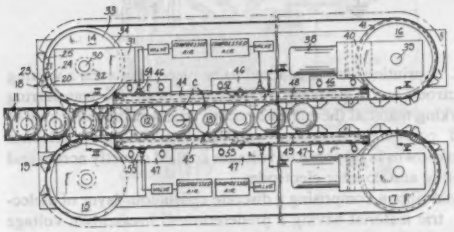
2. An escalator, comprising:
an endless belt having first and second sides,
a plurality of steps attached to said endless belt,
means for driving said endless belt in a loop which includes load bearing and return runs for said steps,
and means for guiding said belt about said loop including a plurality of guide wheels rotatably mounted on said first side of said endless belt on axes perpendicular to the travel direction of the endless belt, and a guide track adjacent to said first side, said guide wheels having a non-flat portion and said guide track having a cooperative non-flat portion, providing a curved interface which guides said guide wheels, with the cross-sectional configurations of the non-flat portions of the guide wheel and guide track defining first and second different curves selected to promote substantially a line contact between each guide wheel and said guide track, wherein only a predetermined central portion of each guide wheel normally comes into contact with the guide track.

4,064,987

CONVEYOR SYSTEM FOR HANDLING NON-RIGID CONTAINERS

Daniel J. Rowan, 26 Strawberry Hill Ave., Stamford, Conn. 06902

Filed Feb. 12, 1976, Ser. No. 657,613
Int. Cl.² B41J *33/44*
U.S. Cl. 198—604 **18 Claims**



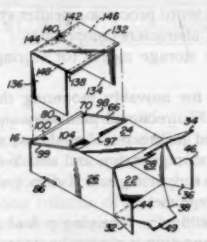
1. A conveyor system for handling containers, comprising a pair of endless belts carried by rollers and arranged to have straight parallel conveying runs, said belts being spaced by a distance commensurate with the diameter of the containers to be conveyed, each belt being provided on its outer surface with a pair of spaced holding jaws for each container, means for synchronously driving said belts, and means including at least one air bag and a source of air under pressure for applying a plurality of adjustable pressures to at least one belt over a plurality of portions of its conveying run to urge said at least one belt toward the other belt in corresponding portions of its conveying run to hold each container without bottom support by applying different pressures to the containers through said holding jaws in each of said plurality of portions of the conveying run of said at least one belt.

4,064,988

DISPLAY CONTAINER

Lowell I. Mazie, 2126 Packard Road; Henry C. Friedman, 1906 Foothill Drive, both of, Huntingdon Valley, Pa. 19006; Nathaniel Getzler, 1213 Davisville Road, Southampton, Pa. 18966, and Jack D. Grollman, 550 Lafayette Road, Merion, Pa. 19066

Filed July 29, 1976, Ser. No. 709,552
Int. Cl.² B65D *5/32*
U.S. Cl. 206—44 R **12 Claims**



1. A container comprising
a box including integral opposed bottom and top walls,

opposed side walls, and flaps forming opposed end walls, said box having an opening formed by said top wall, said side walls and one of the end walls,

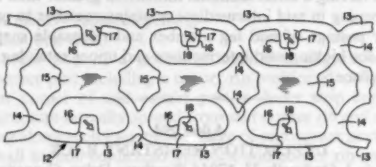
a cover being received in said opening, said cover including a lid wall, two legs integral with said lid wall, and an end wall integral with said lid wall, said legs resting on said bottom wall inside said box, said lid wall having a portion extending under said top wall of said box, said legs being high enough and long enough to bias a portion of said lid wall which extends under the top wall of said box against the latter.

4,064,989

SHIPPING CARTON CONSTRUCTION

Robert Charles Olsen, Streamwood, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 9, 1976, Ser. No. 703,988
Int. Cl.[2] B65D *65/32*
U.S. Cl. 206—428 **3 Claims**



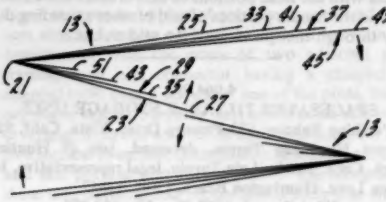
1. A package comprising a shipping carton and a plurality of groups of cylindrical containers carried in said carton in upstanding side-by-side abutting positions, each of said containers having an upper chime extending radially outwardly of the outer side wall surface thereof, the outer diameter of said chime being greater than the maximum diameter of the outer side wall of said containers, a packaging device mounted on each of said groups of containers, each of said packaging devices comprising a sheet of resilient plastics material formed in the shape of a plurality of bands arranged in two adjacent rows, first webs integrally interconnecting the adjacent bands in each row, second webs integrally interconnecting the transversely adjacent bands in said two adjacent rows, each of said bands being elongated in the direction of said rows, a tab integrally formed on each of said bands on the outer band segment of each band substantially at the longitudinal center thereof and extending from the inner periphery of each band, the initial inner peripheral dimension of each of said bands being less than the circumferential dimension of the outer side wall surface of said containers, each of said tabs having a slit extending from one side thereof and substantially into said tab, each of said slits being aligned in said tabs at an acute angle to an imaginary line drawn through said tabs as an extension of the inner periphery of said outer band segment therethrough, and each of said slits positioned in said tabs short of any crossing of said imaginary line into said outer band segments, the distance between the end of each of said slits in said tabs and the other side of each of said tabs opposed to said one side thereof being substantially greater than the transverse width of said outer band segments of each band adjacent to said tabs, each of the bands of said packaging devices being substantially stretched and circumferentially embracing the outer side wall surface of one of said containers with the inner periphery of the band immediately below the upper chime of said container and with the tab of the band extending upwardly to cover said upper chime, and said groups of containers arranged in said carton with the tabs of adjacent packaging devices in an abutting relationship.

4,064,990

PACKAGE FOR WRAPPING PAPER

Walter E. Bennett, Fitchburg, Mass., assignor to Fox Valley Corporation, Appleton, Wis.

Filed June 3, 1976, Ser. No. 692,559
Int. Cl.[2] B65D *85/62*
U.S. Cl. 206—494 **4 Claims**



1. A package for folds of decorative wrapping paper, said package including:

two nests of folds,

each nest of folds including a plurality of folds, each fold being formed of at least one sheet of decorative wrapping paper and having a front panel and a rear panel immediately connected to each other at a backbone,

said front panels of each nest being of different lengths,

said folds being nested one inside the other with the backbones located adjacent to one another and the front panels arranged with longer panels located inwardly of the shorter panels so that all of the front panels of a nest are visible in the nested position of the folds,

each front panel being at least as long as its rear panel, and

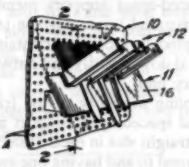
said nests being positioned so that the rear panels of the fold of one nest are adjacent the rear panels of the folds of the other nest and the backbones of the nests are located at opposite ends of the package.

4,064,991

PAINT BRUSH MERCHANDISING DISPLAY

Harold Swanson, New York, N.Y., assignor to Baker Brush Co., Inc., Springdale, Conn.

Filed Feb. 28, 1977, Ser. No. 772,869
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—49 R **5 Claims**



1. A paint brush merchandising display apparatus adaptable to support brushes of a variety of widths comprising, in combination, a generally vertically arrayed display panel, a support tray assembly including attachment means for securing said tray assembly to said panel, said assembly including a horizontally extending planar mounting plate member, said mounting plate member being angularly oriented relative to said panel and including an upper free marginal portion defining an uninterrupted support ledge, and a plurality of brush support members mounted on said ledge and adjustably positionable therealong, said support members including clamp members in the form of inverted U configurations disposed over and frictionally engaging said ledge, a vertically directed divider portion extending from said clamp portion and a transversely directed support web extending from said clamp portion, said web

being fixed to the under surface of said divider portion and extending laterally a distance to both sides of said divider, said web terminating in free edges paralleling said divider portion, said divider portion and said web being inclined away from said panel the opposed webs of adjacent said support members defining spaced parallel tracks whereby a plurality of inverted paint brushes may be mounted between adjacent said support members with the head portions of said brushes seated on said tracks and the handle portions of said brushes extending downwardly through the spaces between said tracks.

4,064,992

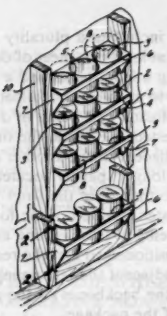
SPACESAVER TILTABLE STORAGE UNIT

John Pershing Ralston, 633 Pumosa Drive, Vista, Calif. 92083; Warren Huntsman Turpin, deceased, late of Huntington Beach, Calif., and by Lola Turpin, legal representative, 16411 Rhone Lane, Huntington Beach, Calif. 92647

Filed Sept. 2, 1975, Ser. No. 609,570

Int. Cl.[2] A47B *73/00*

U.S. Cl. 211—75 **1 Claim**



1. In a storage unit comprising frame members pivotally secured to fixed adjacent spaced-apart generally vertical structural support members for limited pivoted travel between a normal generally vertical storage position and a forwardly inclined access position by pivot and motion restraint means comprising a pivot and a coacting arcuate slot and stop pin received therein the improvement comprising:

at least one frame member of a semi-resilient material and sized to generally correspond to the distance between the adjacent spaced-apart support members and having a generally horizontal upper surface including at least an opening adapted to receive a container and including a pair of integral downwardly and outwardly diverging end plate members; and

means for enabling assembly of the frame member to the adjacent fixed spaced-apart support members comprising a generally straight slot in each of said end plate members generally normal to and having one end in communication with the arcuate slot and extending linearly toward the pivot for reception of the stop pin for positioning the stop pin in the arcuate slot, whereby said frame member is operatively secured to the fixed spaced-apart support members.

4,064,993

MULTI-PURPOSE STAND

Edwin S. Getner, 2549 Alveston Drive, Bloomfield Hills, Mich. 48013

Filed Oct. 18, 1976, Ser. No. 733,393

Int. Cl.[2] A47G *29/00*

U.S. Cl. 211—85 **13 Claims**

1. A knockdown stand assembly comprising: a plurality of leg members, an intermediate retaining member including openings for receiving said leg members for holding said leg members together at an intermediate point and an upper retaining member including openings for receiving said leg members for holding the upper ends of said leg members together; said leg members including an upper portion having cross-sectional dimensions capable of pasage through said openings in said intermediate retaining member, locating means for locating said intermediate retaining member and said upper retaining

member relative to said leg members, said locating means for said intermediate retaining member comprising an enlarged section having a cross-sectional dimension greater than that of said opening in said intermediate retaining member to prevent further passage of said leg member and releasable snap lock means for locking said intermediate and upper retaining member in place.

4,064,994

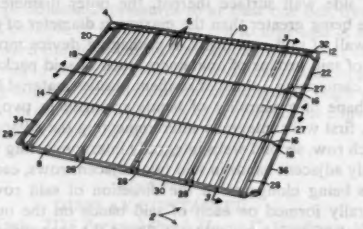
DEFLECTION-RESISTANT RACK

Vladimir J. Ondrasik, II, 17044 Westbury Drive, Granada Hills, Calif. 91344

Filed June 23, 1976, Ser. No. 698,896

Int. Cl.[2] A47F *5/00*

U.S. Cl. 211—153 **8 Claims**



1. A deflection-resistant rack comprising:

a rack member having an endless rectangular structural perimeter member with integral front, rear, left and right members, and a plurality of evenly spaced parallel support members disposed above and rigidly attached to the front and rear members of the structural member; and

a deflection-resistant frame having a plurality of spaced cross-members and a plurality of spaced longitudinal members whereby said spaced longitudinal members are rigidly attached to the bottom of, and in perpendicular relation to, the cross members, the deflection-resistant frame is attached to the bottom of the rack member, the ends of the longitudinal members being attached to the bottom of the front and rear members of the structural member and the ends of the cross-members being attached to the bottom of the left and right members of the structural member such that the longitudinal members of the deflection-resistant frame are in parallel relation to the support members, the ends of the cross-members are bent downwardly and outwardly such that the top edges of the body of the cross-member are in substantially the same plane as the bottom edges of the support member, the

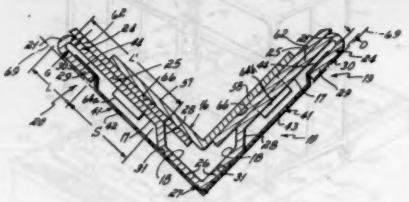
cross members being rigidly attached to the support member whereby to form a space double-bar deflection-resistant support structure.

4,064,995

DISPLAY RACK

Rafael T. Bustos, 1629 Folkstone Road, N.D., Atlanta, Ga. 30329

Filed Feb. 17, 1976, Ser. No. 658,351
Int. Cl.[2] A47F 5/10
U.S. Cl. 211—187 **4 Claims**



1. A display rack comprising
at least one shelf,
a corner post of a generally angular configuration, said corner post including a corner rib positioned at the angular corner of said corner post, a decor strip connector structure laterally spaced from said corner rib and extending along each longitudinal edge of said corner post, a side wall section connected between said corner rib and each decor strip connector structure with at least one of said side wall sections being set back inwardly from a planar external face that includes an exterior surface of said corner rib, and a plurality of shelf locater holes provided along the length of said post in said set-back wall section for establishing a plurality of potential shelf support levels along the length of said post for said shelf,
at least one shelf support clip mounted on the internal face of said corner post, said clip including at least one finger adapted to extend through one of said shelf locater holes to establish said clip at the desired shelf support level, and each shelf being located and supported by a clip relative to the ends of said post, and
a decor strip mounted in said decor strip connector structure on the external surface of said corner post, said decor strip being structured to permit removal of said decor strip from operable combination with said corner post, said corner rib and each of said decor strip connector structures cooperating with said decor strip to define a substantially planar external face for each external face of said post, and said decor strip being structured to overlie said clip's finger for preventing inadvertent contact therewith and for hiding unused shelf locater holes from sight when the corner post's external faces are viewed by an observer.

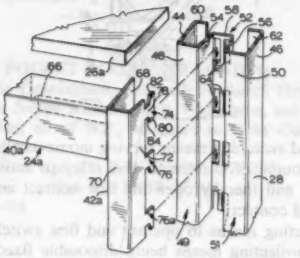
4,064,996

RACK SYSTEM

Robert L. Shillum, 12 Tupper Court, Kitchener, Ontario, Canada, assignor to Robert L. Shillum, Kitchener, Ontario, Canada

Filed Dec. 17, 1975, Ser. No. 641,414
Int. Cl.[2] A47B 43/00
U.S. Cl. 211—191 **4 Claims**

1. A rack system comprising:
a plurality of upright support frames, each support frame including at least one post having first and second side ribs extending longitudinally, and a centre portion extending between the side ribs and defining longitudinally spaced slots, the side ribs being symmetrically disposed to either side of the centre portion and each side rib including an outer portion lying generally perpendicularly to a plane containing the centre portion, a front portion lying generally parallel to the centre portion, and a side portion extending from the front portion to the centre portion at a small angle of divergence with the outer portion; and
shelf support elements adapted to be releasably attached to the support frames for extending horizontally in pairs between adjacent support frames to support a shelf in a horizontal position, each shelf support element comprising: a stringer and a pair of opposite-handed end connectors attached one to each of the ends of the stringer for engagement with the posts of two adjacent support frames, each end connector having a channel shape adapted to fit over a side rib of one of the posts, the channel shape being defined by first and second side portions diverging from one another be said small angle for respective surface-to-surface contact with said outer portion and said side portion, and a front portion extending between these side portions and proportioned such that with said surface-to-surface contact there is a clearance between this front portion and said front portion of said rib, the end



connector being attached to the stringer by the first portion and further comprising first and second coupling elements extending rearwardly from the second portion for engagement in said slots, each of the coupling elements having a cantilever portion and a downward projection dependent from an end of the cantilever portion, the downward projection having a forward face inclined downwardly and rearwardly for engagement with a rearward side of the centre portion of one of the posts upon engaging the coupling elements in such a post, whereby a downward force on the end connector will result in a first wedging action as the rearward faces of the coupling elements ride on the centre portion thereby drawing the end connector into firm and snug engagement with the corresponding side rib of the post and a complementary second wedging action as said face-to-face engagement causes frictional locking between the post and the end connector, this second wedging action being allowed by said clearance between the respective front portion of the ribs and end connector.

4,064,997

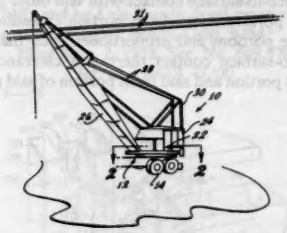
CRANE SWING SAFETY CONTROL

Eugene Richard Holland, 121 S. Reese Place, Burbank, Calif. 91506, and Melvin Glynn Schlieman, Murphys, Calif. 95247

Filed Mar. 29, 1976, Ser. No. 671,567
Int. Cl.[2] B66C 13/48
U.S. Cl. 212—39 B **10 Claims**

1. Means to warn a crane operator of his attaining the limit of a permissible angular rotation of the rotatable turrent of the crane on the platform on which the turret of the crane is carried; said means comprising:
a. electrically operable alarm device;
b. a source of electric current;
c. an electrically operated relay, said relay being connectable to said source of electric current and having a first contact in circuit with said source of electric current and

said warning means and said contact being normally closed to actuate the warning means; said relay having a second contact in circuit with said source of electric current and with the energizing coil of said relay and normally maintained in open circuit breaking position; said relay, when actuated, opening the first contact and closing the second contact; first switching means disposed peripherally on the crane turret to rotate therewith, said first switching means being in series with said second contact and being switched to and maintained in its "on" position, said first switching means when switched to its "off" position serving to open the relay circuit and thereby close the said first contact to operate said warning device;



d. second switching means serving momentarily to connect said source of current to said relay to actuate and the latter; and thereby open the first contact and close the second contact;

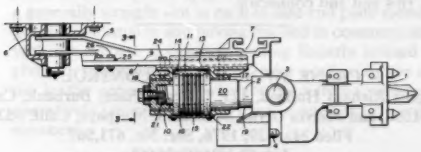
e. projecting means to operate said first switching means, said projecting means being disposable fixedly adjacent the periphery of said crane turrent and at least one predetermined point on, and within the arc of swing of said first switching means on said crane turret, whereby, when said turret is rotated to cause said first switching means to pass and strike said projecting means, said first switching means will be switched from its "on" position to its "off" position, thereby breaking the relay circuit with said power source to de-energize said relay, and cause said second contact to close and operate said warning device.

4,064,998

RAILWAY COUPLER AND DRAFT RIGGING

Walter C. Dilg, Elma, and Wilbert G. Glauser, Alden, both of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 31, 1975, Ser. No. 627,638
Int. Cl.[2] B61G 9/00
U.S. Cl. 213—69 **8 Claims**



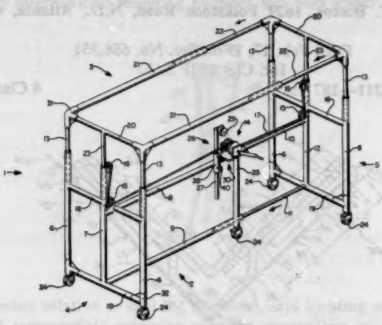
1. In a draft rigging for a railway car, a longitudinally extending drawbar having a lower beam member with an upper bearing surface, a housing having a pocket for containing a cushioning means disposed below the beam member, the housing having means thereabove for slidably engaging the bearing surface of the beam member, the housing containing cushioning means within the pocket and a yoke passing through the cushioning means and extending forwardly from the housing, the yoke being pivotally connected to a coupler.

4,064,999

ADJUSTABLE BUILDING PANEL SCAFFOLD

Simon Young, P.O. Box No. 41, Mamou, La. 70554

Filed July 7, 1976, Ser. No. 700,681
Int. Cl.[2] E04F 21/18
U.S. Cl. 214—1 SW **1 Claim**



1. A panel lifting apparatus for raising and hold ceiling panels in place during attachment thereof to ceiling joists including:

a. a base unit having first and second generally rectangular end units each consisting of three hollow vertical leg members connected at their lower ends and adjacent their upper ends by an upper and lower transverse horizontal brace, said first end unit connected to said second end unit longitudinally by an upper and lower central hollow horizontal brace member, said upper central hollow horizontal brace member being connected adjacent the upper end of the central vertical leg on said first end unit and said lower central horizontal brace member being connected at one end at the bottom of the central vertical leg of said first end unit and having inserted in the opposite ends of said upper and lower central hollow horizontal brace members, one end of each of an upper and lower solid central horizontal brace member, respectively, and having the opposite end of each of said upper and lower solid central horizontal brace members being connected, respectively, adjacent the upper end of the central vertical leg of said second end unit and to the bottom of said central vertical leg of said second end unit so that said base unit is slidably adjustable longitudinally;

b. a carriage unit of a generally rectangular frame registerable over said first and second end units in a horizontal plane normal to the vertical above said first and second end units and said carriage unit being slidably adjustable longitudinally in the same manner as the basement and being slidably connected to said base unit by downwardly extending solid vertical legs, each of which is slidably engaged in a vertical leg of said base unit; and

c. actuating means located on said upper central hollow horizontal brace member including a cable attached to the lower end of each central downwardly extending vertical leg from said carriage unit and attached over a suitable arrangement of pulleys to winch means whereby on operation of the actuating means, said carriage unit is raised or lowered vertically as desired.

4,065,000

PHARMACEUTICAL TABLET AND CAPSULE COUNTER

Gary Murton, P.O. Box 1391, Sonora, Calif. 95370

Filed June 3, 1976, Ser. No. 692,529
Int. Cl.[2] G07D 9/06
U.S. Cl. 214—1 C **1 Claim**

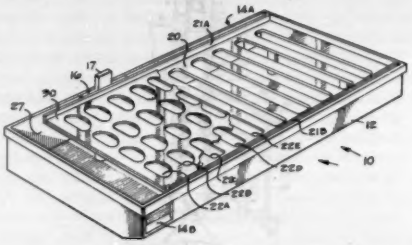
1. Apparatus comprising:

a base comprising a rectangular box with bottom and sides

but without a top, and having openings in the sides at two opposite corners;

a slotted plate having a single row of slots, said slotted plate being rectangular and being disposed parallel to and at a selected distance from the bottom of the base, said distance being less than the height of the sides of the rectangular box to thereby form a region within the base and beneath the slotted plate;

a removable rectangular counting plate slidably disposed on the slotted plate for movement parallel to said sides, said counting plate having an array of openings of semicircular shape arranged in rows and columns wherein the rows are parallel to the slots in the slotted plate;



a slidably movable partition disposed between the slotted plate and the bottom and sides of the base, said partition being less thick than the distance separating adjacent rows of openings in the counting plate and said partition being disposed perpendicular to the bottom and sides of the base to thereby divide the region within the base and beneath the slotted plate into two separate portions; and

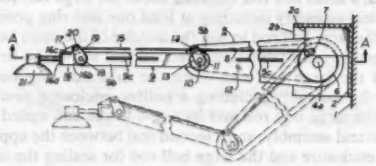
wherein the number of slots in the slotted plate is equal to the number of rows of openings in the counting plate, wherein the rows of openings in the counting plate are spaced a distance apart equal to the spacing of the slots and the width of the slots is at least as great as the corresponding dimension of a row of the openings in the counting plate.

4,065,001

MANIPULATOR

Makoto Ohnaka, Yokohama, Japan, assignor to Shiroyama Kogyo Co., Ltd., Japan

Filed June 15, 1976, Ser. No. 696,250
Int. Cl.² B65G *47/91*
U.S. Cl. 214—1 BV **8 Claims**



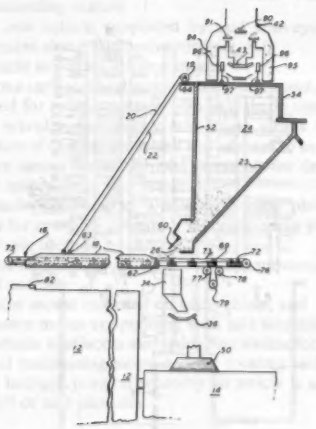
8. A manipulator comprising a first arm assembly having a base end portion and a free end portion attachment means on which said base end portion is pivotally mounted by first pivotal means for pivotal movement about a first pivotal axis, first power means operatively connected to said first arm assembly to effect rotation of the latter about said first pivotal axis, a second arm assembly having a base end portion and a free end portion, second pivotal means pivotally mounting said base end portion of said second arm assembly to said free end portion of said first arm assembly for pivotal movement about a second pivotal axis, second power means, coupling means coupling said second power means to said second arm assembly to effect rotation of the latter about said second pivotal axis, holding means on said free end portion of said second arm assembly for holding an article which is to be moved by the manipulator, third pivotal means for pivotally mounting said holding means to the free end of said second arm assembly for pivotal movement about a third axis, a first coupling lever disposed parallel to the longitudinal axis of said first arm assembly and having a length equal to the length of said first arm assembly, link means pivotally mounting said first coupling lever to said attachment means and to said second pivotal means to thereby define a first parallelogram, a second coupling lever disposed parallel to the axis of said second arm assembly and having a length equal to the length of said second arm assembly, and second link means pivotally mounting said second coupling lever to said second pivotal means and to said third pivotal means to thereby define a second parallelogram, whereby said second pivotal means has an axis which is common in both said first and second parallelogram and said holding means is maintained in a generally horizontal disposition independently of the relative pivotal positions of said first and second arm assemblies.

4,065,002

POCKET DOOR SHIP LOADER

James Thomas Cunningham, Caldwell; Frederick Orren Snow, III, Wayne; Joseph Richard April, Wallington, and A. Tobey Yu, Kinnelon, all of N.J., assignors to Orba Corporation, Fairfield, N.J.

Filed Apr. 22, 1976, Ser. No. 679,330
Int. Cl.² B63B *27/10*
U.S. Cl. 214—14 **4 Claims**



1. A pocket dock ship loader of the type wherein bulk materials are transported from an off dock storage to a dock storage site in preparation for loading of a vessel and wherein the bulk materials may be loaded on such vessel at a speed such as to minimize the demurrage time of such vessel, comprising:

a. at least one pocket constructed on a dock, said pocket to accommodate dock side storage of bulk material;

b. first conveyor means for transporting bulk material from an off-dock source to said pocket;

c. an apron, said apron extending perpendicular to the face of said dock and being positionable in a generally horizontal operating position and a generally vertical stowed position;

d. a first track section mounted on said dock under said at least one pocket;

e. a second track section mounted on said apron, said second track section being aligned and coplanar with said first

track section when said apron is in said generally horizontal operating position;

f. second conveyor means for transporting said bulk material from said pocket to a drop point above the cargo hatch of a bulk material carrying vessel, said second conveyor means being extensible from a stowed position, in which it is entirely supported by said first track section, to an operating position in which it is supported by both said first and said second track sections; and

g. means, mounted on said at least one pocket above said second conveyor means, for regulating the flow of bulk material from said at least one pocket to said second conveyor means.

4,065,003

RAISABLE AND LOWERABLE MAT-LOADING AND PRESS-TRAY UNLOADING DEVICE FOR A MULTI-LEVER PRESS

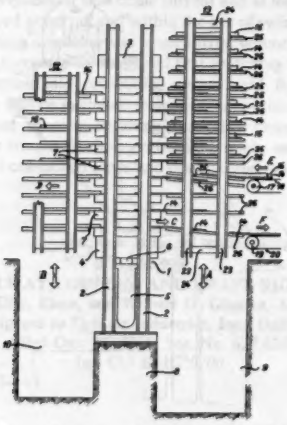
Werner Hostettler, Zurich, Switzerland, assignor to Peter Fahrni, Zurich, Switzerland

Filed Apr. 19, 1976, Ser. No. 678,229

Claims priority, application Switzerland, Apr. 28, 1975, 5447/75

Int. Cl.² B65G 1/04

U.S. Cl. 214—16.6 7 Claims



1. A mat loading and press-tray unloading apparatus for a multi-level press having a plurality of plates for the manufacture of boards said apparatus comprising a raisable and lowerable structure; a set of loading and unloading levels connected to said raisable and lowerable structure, each set corresponding in number to the number of press levels whereby the press is loaded with mats on trays from the loading levels and whereby the unloading levels receive the empty trays; means for raising and lowering said structure, and means for feeding said levels; said loading and unloading levels being arranged one above another such that at one end of said structure at least two loading levels are directly adjacent to each other, at the other end of said structure at least two unloading levels are directly adjacent to each other, and at an intermediate portion of said structure at least one unloading level is disposed between two loading levels.

4,065,004

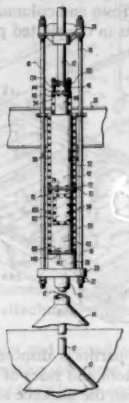
METHOD AND APPARATUS FOR RESEALING THE LARGE BELL ROD IN A DOUBLE BELL CHARGING SYSTEM FOR A BLAST FURNACE

Ronald M. Chadwick, Collinville, and David A. Shearlock, Granite City, both of Ill., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed May 27, 1976, Ser. No. 690,725

Int. Cl.² F27B 11/12

U.S. Cl. 214—36 31 Claims



1. In a blast furnace having a double bell system for charging the furnace through the top thereof, the system including a large bell and a first bell rod for raising and lowering the large bell, and a small bell and a second rod received about the first rod for raising and lowering the small bell, and a first seal between the large and small bell rods at a certain location along the large bell rod; a method of establishing a second seal in situ along the large bell rod at a location spaced from the first seal when the first seal becomes worn, the steps comprising leaving the first seal and the first bell rod in tact, forming an enclosure about the large bell rod at a location above the first seal and with the enclosure having upper and lower open ends, sealing the lower end of the enclosure about the first seal so that any leakage of fluid or material from the interior of the small bell rod along the large bell rod passing through the first seal will be trapped in the enclosure, and sealing the space between the upper end of the enclosure and the large bell rod to seal the interior of the enclosure.

7. In a blast furnace having a double bell system for charging the furnace through the top of the furnace including a large bell rod, a small bell rod received about the large bell rod, and a first seal assembly including at least one seal ring positioned about the large bell rod to seal the interior of the small bell rod; an assembly for establishing a second seal above the first seal around the large bell rod when the first seal ring becomes worn, the assembly including a hollow enclosure positioned about the large bell rod and having a lower end sealed about the first seal assembly, and a second seal between the upper end of the enclosure and the large bell rod for sealing the interior of the enclosure.

4,065,005

DEVICE FOR LOADING RAILROAD CARS FROM A GRAIN STORAGE COMPLEX

Howard C. Mahle, Minnetonka, Minn., and Harris B. Thomas, Ames, Iowa, assignors to Todd & Sargent, Inc., Ames, Iowa and Nott Company, Minneapolis, Minn., part interest to each

Filed Nov. 8, 1976, Ser. No. 739,572

Int. Cl.² B65G 67/06

U.S. Cl. 214—41 R 2 Claims

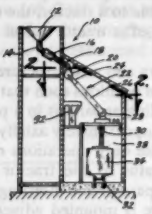
1. In combination with a grain storage facility having a

railroad siding adapted to receive grain carrying hopper cars, the invention comprising,

an overhead track structure positioned over said railroad siding and above any hopper cars thereon,

crane means mounted on said overhead track structure, said crane means comprising a first crane member longitudinally movably mounted on said overhead track structure and a second crane member laterally movably mounted on said first crane member,

a telescopic delivery tube having its lower end universally connected to said second crane member and having its upper end universally connected to said grain storage facility and being adapted to receive grain from said grain storage facility,



power means to move said telescopic delivery tube and said crane members longitudinally and laterally with respect to said track structure,

a normally vertically disposed telescopic tube extending downwardly from said crane means and being in communication with said telescopic delivery tube to deliver grain to hopper cars on said railroad siding, and

said vertically disposed telescopic tube being operatively pivotally connected to said telescopic delivery tube and means for moving said telescopic tube from a vertically disposed grain delivery position to an inclined stored position.

4,065,006

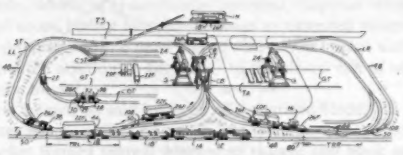
CONTAINER SIDE-TRANSFER SYSTEM

Leonard D. Barry, 19300 Pennington Drive, Detroit, Mich. 48221

Continuation of Ser. No. 428,873, Dec. 27, 1973, abandoned. This application June 27, 1975, Ser. No. 591,101

Int. Cl.² B61K *1/00*

U.S. Cl. 214—42 R **22 Claims**



1. A first and a second track having at least one parallel running transfer run, at least a first and a second vehicle on respectively said first and second track, side transfer means on said first vehicle for extending over to said second vehicle to transfer a load, cam rider means on said first vehicle for operating said transfer means, a cam track extending aways along said first track for each said transfer run with lateral displacement and return for said cam rider means to guide on to displace laterally to extend said transfer means out over to said second vehicle and back to transfer a load to or from said first vehicle, and engaging-disengaging means for engaging a load on said second vehicle with said transfer device and for releasing a load from said transfer means to said second vehicle, and means for keeping said vehicles aligned while moving along said tracks for the transfer run.

4,065,007

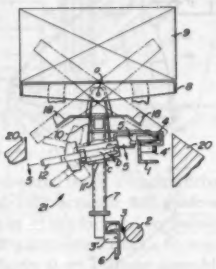
ARTICLE DELIVERY AND UNLOADING DEVICE

Yutaka Kurahashi, c/o Tokyo First Factory, Ishikawajima Harima Jukogyo Kabushiki Kaisha, 1-1 2-chome, Tsukuda, Chuo, Tokyo, Japan

Filed Apr. 21, 1976, Ser. No. 678,817

Int. Cl.² B65G *67/24*

U.S. Cl. 214—62 A **16 Claims**



1. Apparatus comprising:

a single track conveyor line;

at least one unloading station positioned adjacent to said conveyor line;

a stop means positioned along said conveyor line adjacent said unloading station;

at least one vehicle supported by said conveyor line for movement along said conveyor line;

said vehicle including a frame means;

at least one carrier wheel supported by said frame means and adapted for rolling contact with said single track;

a drive wheel supported by said frame means below the elevation of said carrier wheel and adapted to be driven by a drive means carried by said conveyor for driving said frame means along said track;

said vehicle including an article supporting platform and means for rotatably mounting said supporting platform to said frame means;

means for maintaining said platform in a substantially horizontal position;

an actuator means mounted on said vehicle; and

said actuator means cooperating with said stop means when said vehicle is adjacent said unloading station for deactuating said maintaining means and for rotating said platform into a inclined position whereby an article is allowed to slide off of said platform.

4,065,008

REFUSE COLLECTION VEHICLES

Houston Ratledge, Maryville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 5, 1976, Ser. No. 711,834

Int. Cl.² B65F *3/00*

U.S. Cl. 214—83.3 **13 Claims**

1. A refuse collection vehicle comprising:

a rear hopper having an inlet into which refuse is dumped by an operator,

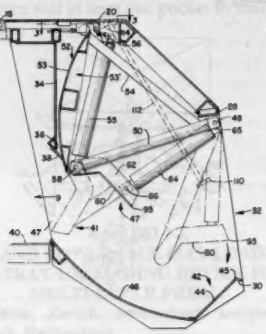
a packer plate for compacting refuse in said hopper,

power means connected to said packer plate for displacing said packer plate through a loading cycle wherein refuse in said hopper is compacted within the hopper, and

cycle interrupt means automatically responsive to the arrival of said packer plate at a predetermined location in said cycle relative to said hopper prior to full compaction of the refuse for deactivating said power means, and

manually actuable means for reactivating said power means to continue said loading cycle subsequent to such deactivation.

13. In a method of loading refuse into a rear end loader vehicle in which an operator dumps refuse over a rear transverse edge of said vehicle and into a hopper portion of the vehicle and subsequently manually activates a power system on the vehicle which displaces a packer plate through a loading cycle within the hopper in which the packer plate travels downwardly past said transverse edge, compacts the refuse in



the hopper, and transfers the refuse from the hopper to a storage portion of the vehicle, the improvement comprising the steps of:

causing said power system to be automatically deactivated solely in response to the arrival of said packer plate at a predetermined position above said transverse edge and independently of manual activation of said power system, and

maintaining said power system deactivated in the absence of manual reactivation by an operator.

4,065,009

MATERIAL HANDLING APPARATUS

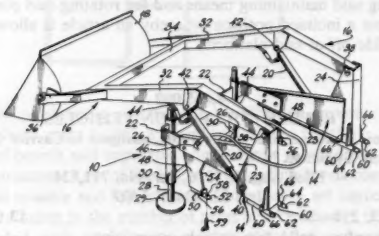
John L. Old, Kenilworth, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands

Filed Sept. 4, 1975, Ser. No. 610,363

Claims priority, application United Kingdom, Sept. 19, 1974, 40828/74

Int. Cl.² E02F 3/72

U.S. Cl. 214—131 A **7 Claims**



1. Material handling apparatus for attachment to a tractor, the apparatus comprising:

a U-shaped support structure to fit round the front end of a tractor;

a pair of posts forming part of said support structure and rigidly secured thereto so as to extend upwardly when the apparatus is attached to a tractor;

a boom, said boom being pivotally mounted at one end on each of said posts, the other end of the boom being adapted to have mounted thereon a material handling implement;

a thrust device connected to the boom, said thrust device being operable to effect pivotal movement of the boom relative to the posts;

attachment means at each side of said support structure whereby the support structure may be attached to and detached from a tractor; and

a stand connected to the support structure and operable to support the material handling apparatus when said apparatus is detached from a tractor;

characterized in that each of said attachment means comprises two laterally spaced pairs of attachment elements, each pair of attachment elements comprising a rod member secured to said support structure in the region of the lower end of its respective post and structure defining a socket fastenable to a tractor, the rod members extending longitudinally of a tractor when mounted thereon; and that

said rod members and said structures defining said sockets are mounted in positions such that said stand supports the material handling apparatus in a position so that said rod members are approximately axially aligned with said sockets whereby the only operations required for attachment of said apparatus to the tractor is driving the tractor toward the apparatus and inserting retaining pins; and that

a guide structure is mounted adjacent at least one of said attachment means, the guide structure being engageable with at least one of its respective rod members upon forward movement of a tractor on which the apparatus is to be mounted, the guide structure being effective to guide said rod member into its respective socket; and that at least two of said structures defining a socket are formed integrally with a U-shaped bracket one at each end thereof, the U-shaped bracket being proportioned so as to pass underneath a tractor and being adapted to be fastened thereto.

4,065,010

SWING VALVE CIRCUIT

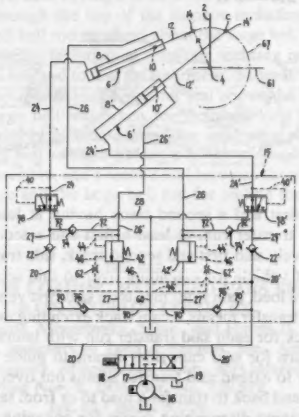
David L. Worback, Highland, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 559,271, March 17, 1975, Pat. No. 4,007,845. This application Feb. 2, 1976, Ser. No. 654,675

The portion of the term of this patent subsequent to Feb. 15, 1994, has been disclaimed.

Int. Cl.² E02F 3/32

U.S. Cl. 214—138 D **24 Claims**



1. Control for a swing member mounted for side-to-side swinging movement having power means connected with the

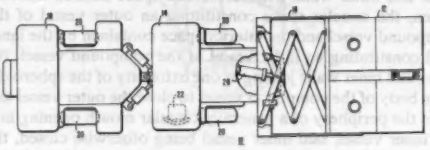
swing member for causing the swing member to swing in opposite directions in response to flow of fluid in opposite directions to and from the power means including at least one pair of lines for conducting fluid to and from the power means; the swing member being responsive to flow of fluid to said power means in one of said lines to swing in one direction, and responsive to flow of fluid to the power means in the other of said lines to swing in the opposite direction; a pressure reducing metering valve controlling one of said lines, said pressure reducing metering valve being operable to limit pressure to the power means through said one line to a predetermined maximum pressure upon movement of the swing member in one direction, and to meter fluid from the power means through said one line upon movement of the swing member in opposition to fluid supplied to the power means, and a metering valve operable to permit flow of fluid from said power means through said other line during the swinging movement of the swing member only when a predetermined minimum pressure exists in one of said lines.

4,065,011

PORTABLE WATER SCOOP

John J. Teti, Saltville, Va., assignor to Pyott-Boone Machinery, Corporation, Saltville, Va.

Filed Sept. 3, 1976, Ser. No. 720,103
Int. Cl.² E02F *3/81*
U.S. Cl. 214—146 E **11 Claims**



1. A self-powered rubber tired operator controlled mine vehicle for collecting, transporting and discharging water comprising:

a scoop bucket, having an open end and a closed end, supported on one end of the mine vehicle;

a blade, which is hydraulically operated, disposed within said scoop bucket movable between an extended position in proximity to the open end of said scoop bucket and a retracted position, in proximity to the closed end of said scoop bucket;

a hook formed on said hydraulically operated blade;

a water scoop, defining a generally closed vessel, having a pocket formed therein adapted to engage said hook and being formed to fit the contour of said scoop bucket and said blade to permit being drawn into said scoop bucket when engaged by said hook and said hydraulically operated blade is retracted;

said water scoop having a pocket formed therein adapted to engage said hook and being formed to fit the contour of said scoop bucket when engaged by said hook and said hydraulically operated blade is retracted;

said water scoop having a sealable opening formed in one end thereof through which water can flow when unsealed; and,

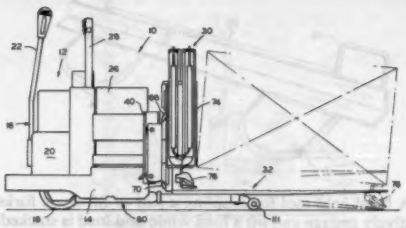
gate means operable in response to the vehicle operator for opening and closing the sealable opening formed in said water scoop.

4,065,012

LOW LIFT TRUCK

Jack O. Rocco, Burlington, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Apr. 2, 1976, Ser. No. 673,221
Int. Cl.² B60P *1/02*
U.S. Cl. 214—510 **15 Claims**



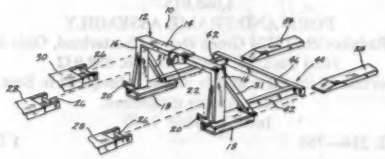
1. In a low lift powered truck, a tractor drive portion having a main frame, hydraulic actuator and guide means supported from and rearwardly of the forward end portion of said frame, vertical guide means supported from a forward end portion of said frame, a relatively short L-frame assembly having a horizontal leg portion extending beneath and forwardly of said main frame and a vertical leg portion actuatable by said hydraulic actuator for guided vertical movement, a pivoted load wheel means and actuator assembly connected to said L-frame assembly and cooperating with said hydraulic actuator means to raise and lower said L-frame bodily vertically, and a relatively long L-frame assembly coupled with said vertical guide means for guided vertical movement in at least a portion of its travel, said long L-frame overlapping, extending forwardly of and elevatable by said short L-frame.

4,065,013

FORKLIFT ATTACHMENT FOR MOVING THREE-POINT MOUNTED EQUIPMENT

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing, Inc., Lexington, Nebr.

Filed Sept. 30, 1976, Ser. No. 728,292
Int. Cl.² B66F *9/12*; B60D *1/04*
U.S. Cl. 214—620 **6 Claims**



1. A forklift attachment for moving three-point mounted equipment comprising,

an upstanding frame having a cross member and oppositely disposed legs,

connecting means on each leg adapted to detachably engage the arms of a forklift vehicle,

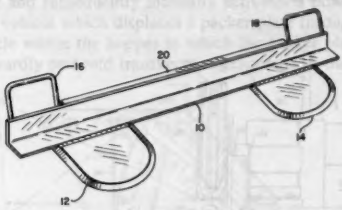
connecting means on each leg and on said cross member adapted to detachably engage the connecting means on a three-point mounted implement, and

a stop means on said frame for selectively spacing said frame from a forklift vehicle by said stop being positioned to engage the upstanding standard on the forklift vehicle, said stop being U-shaped and having a cross member and perpendicularly extending oppositely disposed arms pivotally and operatively connected to said frame legs.

4,065,014
SLIPSHEET PALLET TOOL AND METHOD

Darrell J. Sagmiller, Rte. 1, Box 114, Cornelius, Oreg. 97113

Filed Sept. 27, 1976, Ser. No. 727,226
Int. Cl.[2] B66F 9/12
U.S. Cl. 214—621 4 Claims



1. A hand-held tool for enabling a pair of lift truck forks to operatively engage and lift a load while said load is stacked on a slipsheet resting directly on a floor, said tool comprising:

a. a laterally extending elongate frame;

b. a pair of plates, having upper and lower major surfaces, attached to said frame at laterally spaced positions along the length of said frame and projecting forwardly from the bottom of said frame in a direction perpendicular to the length of said frame for inserting beneath said slipsheet, said major surfaces of each said projecting plate extending laterally with respect to said frame;

c. a generally laterally extending leading edge on the forwardly projecting portion of each of said plates, each said leading edge being tapered forwardly and downwardly from the upper surface of said plate toward the lower surface thereof so as to form a sharp edge substantially coincident with the lower surface of said respective plate;

d. a pair of laterally spaced, laterally extending cam surfaces, each of said cam surfaces being connected to the rear of a respective one of said plates and being inclined forwardly and downwardly to a level coincident with the lower surface of said plate for engagement by said lift truck forks;

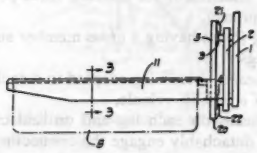
e. a laterally extending rear surface of said frame extending vertically upward from the rear of said plates for engagement by said lift truck forks to push said plates beneath said slipsheet; and

f. means extending rearwardly from the top of said rear surface of said frame for preventing said forks from disengaging upwardly from said rear surface.

4,065,015
FORK AND FRAME ASSEMBLY

Louis Radakovich, 13324 Green Drive, Chesterland, Ohio 44026

Filed Sept. 18, 1969, Ser. No. 858,932
The portion of the term of this patent subsequent to Sept. 27, 1994, has been disclaimed.
Int. Cl.[2] B66F 9/00
U.S. Cl. 214—750 1 Claim



1. In lift frame construction of the class described, in combination, a frame, said frame including a vertical frame section having means for connection to a fork lift truck, horizontal frame means extending outwardly therefrom, said frame means comprising a pair of forks for a fork lift truck arranged in the form of a U-shaped member by connecting together the ends of the normally vertical arms thereof to constitute the cross bar of the said member, the side edges of the normally horizontal arms thereby becoming upper surfaces of the spaced arms of the said U-shaped member, the vertical frame section comprising a pair of vertical parts secured at their lower ends to the side edges of the normally vertical arms, a cross piece extending between the parts at their upper ends, downwardly open upper hooks at said ends, a cross piece connected to the lower side edges of the arms aforesaid, and upwardly open hooks on the latter for connecting the frame to such fork lift truck in cooperation with the upper hooks aforesaid.

4,065,016
COMPOUND VESSEL

David R. Perkins, 41 Wheeler St., Gloucester, Mass. 01930

Filed Dec. 27, 1976, Ser. No. 754,427
Int. Cl.[2] B65D 1/04
U.S. Cl. 215—6 6 Claims

1. A compound vessel formed of a transparent clear material and having a spheroidal main body, comprising spheroidal inner and outer walls with an annular space defined therebetween, the annular space constituting an outer vessel of the compound vessel and the interior space contained by the inner wall constituting an inner vessel of the compound vessel, the outer and inner walls joining at one extremity of the spheroidal main body of the compound vessel to close the outer vessel and form the periphery of a generally circular mouth opening into the inner vessel, said inner vessel being otherwise closed, the outer wall terminating at an opposite extremity of the spheroidal main body of the compound vessel to form the periphery of a generally circular mouth opening into the interior of the outer vessel, said outer vessel being otherwise closed said outer vessel being filled with a transparent clear liquid so that the liquid fills the outer vessel to cover the inner wall when the compound vessel is positioned upon a supporting surface, whereby the inner vessel and the supporting surface completely enclose the interior space of the inner vessel to fully enclose objects contained therein, said spheroidal shape and said liquid cooperating to magnify objects placed in the interior space viewed from any position on the exterior side of the compound vessel.

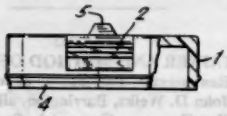
4,065,017
SAFETY CONTAINER AND CLOSURE

George William Burton, London, England, assignor to Johnsen & Jorgensen (Plastics) Limited, London, England

Filed Oct. 18, 1976, Ser. No. 733,420
Claims priority, application United Kingdom, Oct. 22, 1975, 43418/75
Int. Cl.[2] B65D 55/02, 85/56; A61J 1/00
U.S. Cl. 215—211 8 Claims

1. A container and closure assembly comprising a container having a circular mouth, plug means matingly received securely within said mouth, said plug means having a top and a generally cylindrical side wall, said top being configured to prevent a user from gripping and pulling said plug means from

said mouth, said container having a side wall with an opening therethrough adjacent said mouth sized to enable a user's finger to solidly contact the plug side wall through said opening, a minor segment of the circumference of said plug side wall having an irregular surface providing sufficient friction to enable a user to manually push said plug means out of said



mouth, the major portion of the circumference of said plug side wall having a smooth surface providing insufficient friction to enable a user to manually push said plug means out of said mouth, and said plug means being manually rotatable within said mouth to selectively expose the irregular surface or a portion of the smooth surface of the plug side wall through the opening through the container side wall.

4,065,018

CLOSURE MEANS AND METHOD

William J. Megowen, Carlisle, and Harvey M. Cohen, Needham, both of Mass., assignors to William J. Megowen, Carlisle, Mass.

Filed Aug. 2, 1976, Ser. No. 710,412
Int. Cl.[2] B65D *51/26, 53/00*
U.S. Cl. 215—231 **15 Claims**

1. A volumetric member for insertion into a fragile container for gassy liquids, said member having a thimble-like shape and having at least two openings extending through the walls thereof, one opening being above the other, the lower of said openings being of a size sufficient to permit liquid within said member to drain therefrom by gravity and the upper of said openings being smaller than the lower of said openings and of a size sufficient to permit pressure equalization between said member and a sealed fragile container into which said member is inserted.

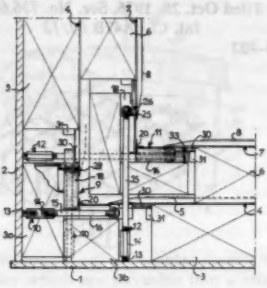
4,065,019

FLUID-TIGHT ISOTHERMAL TANK FOR LIQUEFIED GAS

Jean-Claude Letourneur, Sainte Adresse, and Pierre Jean, Montivilliers, both of France, assignors to GAZ-Transport, Paris, France

Filed Aug. 9, 1976, Ser. No. 712,965
Claims priority, application France, Aug. 22, 1975, 75.25965
Int. Cl.[2] B65D *25/18*
U.S. Cl. 220—9 LG **23 Claims**

1. In a fluid-tight thermal insulating tank for holding a liquid product, said tank comprising two sets of successive sealing and thermal insulating barriers, a primary set positioned to contact the product contained in the tank and a secondary set located between the primary insulating barrier and an external supporting structure, at least the primary sealing barrier comprising metallic plates having inwardly projecting flanged edges welded together and terminating at the intersection between two walls of the supporting structure in a deformable ring the improvement according to which said ring comprises; a composite deformable angle assembly, said angle assembly comprising, a first flange and a second flange, each flange comprising a plurality of generally parallelopipedic shaped modules, a facing surface including a strip of metal connected to and spacing said modules regularly and in a longitudinally



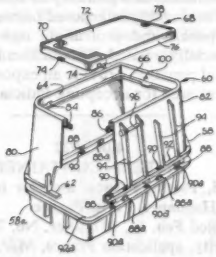
juxtaposed arrangement, and connecting means for joining said facing surface of one of said flanges to the facing surface of the other of said flanges at essentially a right angle so that the modules of said one flange bear against the modules of the other said flange; and securing means connected between the angle assembly and the external supporting structure for holding said modules against the subjacent insulating barrier.

4,065,020

METER BOX HAVING ROTATABLE COVER AND INTERLOCKING MEANS

John Reese Carson, LaVerne, Calif., assignor to Carson Industries, Inc., La Verne, Calif.

Continuation-in-part of Ser. No. 601,047, July 30, 1975, Pat. No. 3,952,908. This application Feb. 23, 1976, Ser. No. 660,061
Int. Cl.[2] B65D *25/24;* H02G *3/08;* B65D *43/16*
U.S. Cl. 220—18 **10 Claims**



1. A meter box assembly comprising:

a. a round meter box having an open top with an upwardly extending rim forming a ledge member and a plurality of inward extending support members disposed on the inside surface of said box adjacent the top thereof, said support members disposed beneath said rim a predetermined distance;

b. a cover member configured so as to rest on said support members and being axially rotatable between a first open position and a second closed position, said cover having means for engaging said ledge member when in said first position, said means for engaging said ledge member are disengaged therefrom and said cover is removable, and when in said second position, said means for engaging said ledge member engage said ledge member thereby preventing removal of said cover from said box; and

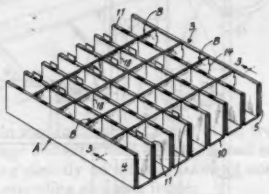
c. locking means, said locking means disposed on said cover such that when said cover is in said second position, actuation of said locking means prevents the substantial rotation of said cover in any direction.

4,065,021

PAD AND DIVIDER COMBINATION

Elizabeth Kedzierski, 775 Austin Ave., Oradell, N.J. 07649

Filed Oct. 28, 1976, Ser. No. 736,609
Int. Cl.[2] A47B *88/12*
U.S. Cl. 220—22 4 Claims



1. A pad and divider of the releasably engaging aperture and notched sheet-type constructed from cut and scored fiberboard or the like and forming partitions intersecting at right angles for dividing a walled container into a plurality of rectangular indexed compartments, said pad and divider comprising;

a. a plurality of suitably cut substantially rectangular blanks forming a series of transverse panels, said transverse panels having vertical slots therein communicating with their lower edges,

b. a substantially rectangular blank suitably cut and scored and folded forming a pad of smaller area than the blank area and a series of parallel lateral upstanding dual coplanar panels hinge-folded at their upper edges, said coplanar panels having spacially related lateral slots within said hinge-folds and having vertical slots therein communicating with the hingefolded edges, said vertical slots interengaging the slots of the transverse panels and interlocking the transverse and coplanar panels at the points of intersection, and

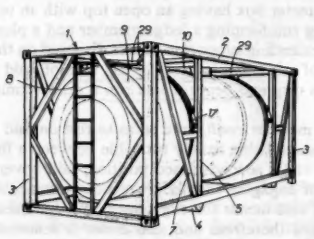
c. indexing means for the compartments of the pad and divider consisting of a plurality of substantially rectangular blanks removably interposed between the walls of the coplanar panels and protruding upwardly through the lateral spacially related slots in the hinge-folded upper edge of said panels to provide an exposed section of blank of sufficient area for accepting indicia.

4,065,022

CISTERN CONTAINER

Henri Cainaud, Talant, France, assignor to Societe des Etablissements Hugonnet, Paris, France

Filed Feb. 14, 1977, Ser. No. 768,561
Claims priority, application France, Mar. 5, 1976, 76.06348
Int. Cl.[2] B65D *7/42;* A47G *23/02*
U.S. Cl. 220—71 13 Claims



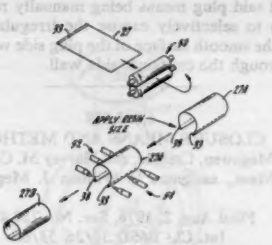
1. A cistern container assembly comprising: a cistern; a frame; a number of substantially semi-circular cradles in the frame on which cradles the cistern rests; a similar number of external reinforcing hoops on the cistern, each hoop corresponding to an associated one of said cradles; an external groove in each reinforcing hoop; and resilient padding means located in each of said grooves; each cradle engaging in the external groove of the associated reinforcing hoop.

4,065,023

CONTAINER AND METHOD OF FORMING

Kenneth R. Rentmeester, Barrington; John A. Jurcenko, Chicago, and John D. Welks, Barrington, all of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Nov. 24, 1975, Ser. No. 635,152
Int. Cl.[2] B65D *7/34;* B29D *23/10*
U.S. Cl. 220—75 15 Claims



1. A method of producing a sheet metal container body having opposed longitudinal margins overlapped to form a bonded lap side seam, comprising the following steps starting with a pre-cut body blank having one side with a surface to which a bonding resin will bond and having a surface on the other side to which an adhesive will bond:

A. applying to the lap margin of the body blank on said one side a bonding resin size in an area limited to substantially no more than the area of the lap seam, said bonding resin being one which may be initially cured by heat and which attains a stage of final cure when re-heated;

B. heating the body blank substantially in the restricted area of the resin size to a temperature which will initially cure the resin;

C. applying said adhesive to the lap margin of the body blank at said other side, said adhesive being one which attains a stage of activation in the presence of heat and in that stage will bond to the resin; and

D. pressing the lap margins together under conditions of final cure for both the resin and adhesive to complete the bonded seam.

4,065,024

SAFETY CLOSURE FOR PORTABLE RECEPTACLES

Max Raymond Atwell, 1461 Kingsberry Drive, Casper, Wyo. 82601

Filed Oct. 7, 1975, Ser. No. 620,262
Int. Cl.[2] B65D *47/20;* A47G *19/14*
U.S. Cl. 220—203 6 Claims

1. A unitary safety pouring and sealing accessory for vessels of the type having a primary opening therein for permitting ingress and egress of liquids and a relatively small venting opening adjacent and coplanar with such primary opening for normally venting the interior of such vessel to the surrounding atmosphere when said primary opening is closed, comprising

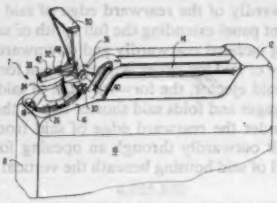
flash-arresting means,

intermediate means connected to said flash-arresting means and having a mouth-defining means for the ingress and egress of fluids passing through said flash-arresting means,

cap means forming a closure for said mouth-defining means,

biasing means for resiliently urging said cap means into sealing contact with said mouth-defining means,

securing means intermediate said flash-arresting means and said mouth-defining means for removably securing said unitary safety accessory in the primary opening of such a vessel with said flash-arresting means positioned within such vessel and said mouth-defining means exterior thereof, and an imperforate



annular gasket means and cooperating flange means contiguous with said securing means and encircling said accessory, said gasket means and said flange means being adapted to form a fluidtype seal between said accessory and the vessel around such primary opening therein, said annular gasket means and said flange means having a sufficient outer diameter to overlie and sealingly close the adjacent venting opening in such vessel, whereby the sole means of ingress and egress of fluids into and from such vessel is through said flash-arresting means.

4,065,025

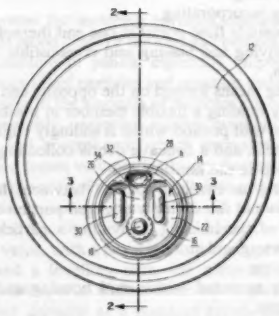
EASY OPENING CAN END WITH PUSH-IN TABS

Vinson S. Potts, Cherry Hill, N.J., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 637,867, Dec. 4, 1975, abandoned, and a continuation-in-part of Ser. No. 596,530, July 16, 1975, abandoned. This application July 1, 1976, Ser. No. 701,623

Int. Cl.² B65D *51/22*

U.S. Cl. 220—258 **56 Claims**



1. A can end of the easy opening type comprising:

an end panel having a preformed dispensing opening therein and a rivet receiving opening; and

a tab adapated to be pushed inwardly including a rivet extending through said rivet receiving opening to the exterior side of said end panel, said tab including a closure portion closing said dispensing opening on the interior side of said end panel.

4,065,026

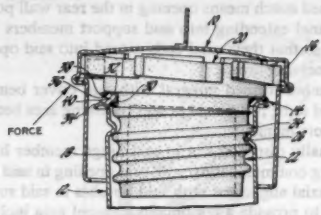
COMPLIANT GROOVED SEALING RING FOR THREADABLY SECURED ASSEMBLY

Donald L. Williams, Port Clinton, and James T. Baker, Sandusky, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1976, Ser. No. 736,428

Int. Cl.² B65D *55/14*

U.S. Cl. 220—304 **2 Claims**



1. In combination, a pair of tubular members threadably secured together which are forceable into a relatively tilted relationship, said members having axially spaced annular seats, an elastomeric seal ring of circular cross-section arranged between and engaging said seats but free to expand radially, said sealing ring having a radially facing circumferential V-shaped groove with a depth substantially greater than half the thickness of the ring and an included acute angle that provides lips between said seats such that when a predetermined tightening torque is applied to tighten one member on the other and the ring is thereby squeezed between the seats and expands radially while the lips are forced toward but do not touch each other and then on forced substantial relative tilting of the members which tends to unseat the ring at some circumferential location the lips at this location remain preloaded to maintain sealing while at the diametrically opposite location the lips are forced toward direct contact.

4,065,027

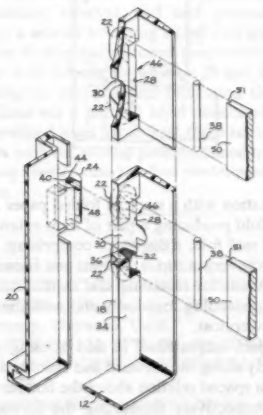
HINGE ARRANGEMENT FOR ROOM AIR CONDITIONER ACCESS DOOR

Bruce J. Ruark, and Richard L. Shaner, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Apr. 11, 1977, Ser. No. 786,111

Int. Cl.² B65D *43/14, 51/04*

U.S. Cl. 220—343 **5 Claims**



1. A room air conditioner unit including a control means, a front panel member having an opening communicating with

said control means, a cover hingedly mounted on said panel being rotatable between a closed position over said opening to an open position to provide access to said control means through said opening, a plurality of hinge means, each comprising:

a pair of support members formed integral with the front wall portion of said panel, being arranged on the axial ends of an aperture in said panel to form a receiving area between said support members;

axially aligned notch means opening in the rear wall portion of said panel extending into said support members being arranged so that their axial ends extend into said opening in said receiving area;

a hinge member formed integral with said cover being dimensioned to be positioned in said receiving area between said support members;

a longitudinally disposed slot in said hinge member having its opening communicating with said opening in said panel being in axial alignment with said notches in said support members to provide a continuous channel area including the open portion of said notches and slots communicating with said rear wall portion when said hinge member is positioned in said receiving area in its closed cover position;

a pivot pin arranged in said channel area for allowing rotational movement of said cover relative to said panel, while preventing removal of said cover from said panel when it rotates from its open position inasmuch as said pivot pin is trapped between the hinge member and the support members when said cover is rotated from its closed position and the slot opening in said hinge member forming a portion of said channel is disposed radially relative to the openings of said notches.

4,065,028

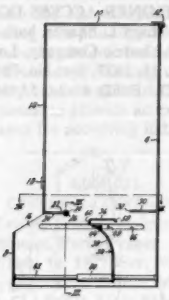
PAPER NAPKIN DISPENSER

John B. Merila, 6223 E. 127th St., Grandview, Mo. 64030

Filed June 4, 1976, Ser. No. 693,004

Int. Cl.[2] B65H *1/06, 3/26*

U.S. Cl. 221—36 **2 Claims**



1. In combination with a stack of folded paper napkins each having a final fold producing a pair of flaps extending unequal distances from said fold, a dispenser comprising:

a. a housing having a top, a bottom and forward, side and rearward walls for receiving said napkin stack with their final folds extending forwardly and with the shorter flaps thereof lowermost,

b. spaced apart ledges fixed in said housing and disposed respectively along the forward and rearward walls of said housing, in spaced relation above the bottom of said housing, and respectively supporting the forward and rearward edge portions of said napkin stack, said rearward ledge being of insufficient forward extent to project beneath the shorter flap of the lowermost napkin of the stack, whereby said flap hangs downwardly between said ledges by gravity, and

c. an ejector carried in said housing below said ledges for horizontal forward and rearward reciprocal movement, and including a horizontal top panel extending substantially the full width of said housing in closely spaced apart relation beneath said ledges, and having parallel front and rear edges extending transversely of said housing, the forward edge of said top ejector panel, when said ejector is in its rearmost position, being generally in vertical alignment with the forward edge of said rear ledge, and being disposed, when said ejector is in its forwardmost position, well forwardly of the rearward edge of said front ledge, and a front panel extending the full width of said top panel and being inclined rearwardly and downwardly from the front edge of said top panel, whereby upon forward movement of said ejector, the forward edge of said top ejector panel engages and folds said shorter flap of the lowermost napkin under the rearward edge of said front ledge and projects it outwardly through an opening formed in the front wall of said housing beneath the vertical level of said ledges.

4,065,029

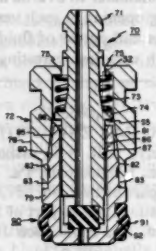
VALVE ASSEMBLY

Stephen Peter Chernock, Flax Mill Lane, Milford, Conn. 06460

Continuation-in-part of Ser. No. 503,365, Sept. 5, 1974, abandoned. This application Jan. 14, 1976, Ser. No. 649,220

Int. Cl.[2] B67B *7/24*

U.S. Cl. 222—3 **37 Claims**



1. A valve assembly for controlling the flow of a combustible fluid comprising:

A. a housing incorporating

a. a combustible fluid portal at one end thereof positioned for receiving and passing said combustible fluid therethrough,

b. retaining means formed on the opposite end thereof for securely holding a flexible member in position

c. an inner wall portion which is slidingly engaged with a valve stem, and a concave debris collecting zone

1. formed in the housing and

2. having an entrance located between the retaining means and the slidingly engaged portion of the inner wall of the housing, providing a particulate debris collecting and storing zone;

B. a valve stem

a. slidably mounted within said housing and extending therefrom,

b. movable from a first closed position to a second open, fluid flow position,

c. having an outer wall, a portion of which is in sliding engagement with said inner wall portion of the housing, forming a sliding zone therebetween, and

d. incorporating a shoulder radially extending from the outer wall thereof towards the peripherally encircling housing and spaced above the entrance of the collection zone, thereby providing a deflector for directing particulate debris into the collection zone and away from the

sliding zone, preventing debris fouling of the sliding zone; and,

C. a flexible member

a. mounted under compression between said shoulder portion of said valve stem and said retaining means of said housing in direct contact with said retaining means, and

b. normally biasing said valve with said housing in said first closed position.

4,065,030

APPARATUS FOR METERING PARTICLES CONTAINING LIGNOCELLULOSE, SUCH AS WOOD CHIPS OR THE LIKE, WHICH ARE TO BE PROVIDED WITH BINDERS

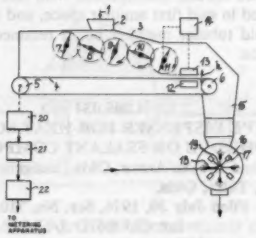
Berndt Greten, Springe, Germany, assignor to Bison-werke Bahre & Greten GmbH & Co. KG, Germany

Filed May 20, 1976, Ser. No. 688,320

Claims priority, application Germany, May 20, 1975, 7515958[U]

Int. Cl.² B67D *5/14*

U.S. Cl. 222—55 **6 Claims**



1. Apparatus for metering particles containing lignocellulose, such as wood chips or the like, and binders, for the continuous manufacture of panels, especially chipboards, wherein constant amounts of particles and constant quantities of binder corresponding to the amounts of particles are fed per time unit to a continuously operating mixing machine, comprising a measuring and control unit which measures by radioactive radiation and senses volumetrically any fluctuations in the bulk density of a quantity of said lignocellulose-containing particles; wherein said apparatus for metering said particles and binders maintains the quantitative ratio of said particles and binders at a constant value, with a metering tank equipped with levelling elements and a levelling rake, the metering tank having a bottom consisting of an endless bottom belt guided over deflector rolls and drivable at a constant speed, said bottom belt feeding the material present in the metering tank to a gluing mixer, said gluing mixer being connected to a pump conveying binder from a storage bin, and wherein a top run of the endless bottom belt is associated, between the levelling rake and the deflector roll corresponding to the delivery point, with a radiation-emitting and receiving device serving for the control device for vertical adjustment of the levelling rake and comprising pulse generating means for a vibrating capacitor in order to sense volumetrically any fluctuations in the bulk density.

4,065,031

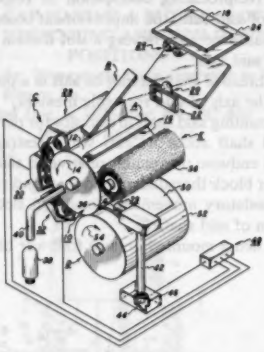
PROGRAMMABLE DEVELOPMENT CONTROL SYSTEM

Douglas G. Wiggins, Rochester, and Edward L. Kushall, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed July 23, 1976, Ser. No. 708,150

Int. Cl.² B67D *5/08*

U.S. Cl. 222—56 **4 Claims**



1. A control device for regulating particle dispensing from a storage container to a mix, including:

means for sensing the concentration of particles in the mix at predetermined sampling intervals, said sensing means generating successive signals indicative of the particle concentration within the mix at each sampling interval;

means for summing the signals from said sensing means and forming a plurality of output signals therefrom; and

programmable means, operating on the output signals received from said summing means having operator reprogrammable circuitry to develop predetermined differing actuating signals energizing the storage container to dispense predetermined differing quantities of particles into the mix corresponding to the actuating signal transmitted therefor, said programmable means develops a first actuating signal energizing the storage container to dispense a first predetermined quantity of particles into the mix in response to said summing means generating an output signal indicating that said sensing means detected a particle level concentration beneath a predetermined level for one sampling interval, and said programmable means develops a second actuating signal energizing the storage container to dispense a second predetermined quantity of particles into the mix in response to said summing means generating an output signal indicating that said sensing means detected a particle level concentration beneath a predetermined level for at least three successive sampling intervals with the second predetermined quantity of particles being greater than the first predetermined quantity of particles.

4,065,032

CONTAINER-FILLING MACHINE WITH FILL ADJUSTMENT DURING OPERATION

George C. Lydiksen, Pleasanton, Calif., assignor to Simplex Filler Company, Hayward, Calif.

Filed Oct. 12, 1976, Ser. No. 731,134

Int. Cl.² G01G *13/34*; G01F *11/16*

U.S. Cl. 222—77 **12 Claims**

1. In a container-filling machine having a conveyor for moving an open-topped container to and away from a filling station, a filler tube at said filling station for filling said container, a reservoir of material to be filled into said container, a cylinder having an inlet connected to said reservoir and an

outlet connected to said filler tube, means including a reciprocable piston in said cylinder for drawing material into said cylinder from said reservoir upon movement of said piston in one direction and for discharging said material from said cylinder to said filler tube upon opposite movement of said piston, a rotatable member mounted on the frame of said machine, means for rotating said member about a fixed axis, said member having a cam thereon offset from said axis and movable with said member through an orbital path around said axis, and means for reciprocating said piston in response to orbital movement of said cam, the improvement comprising:

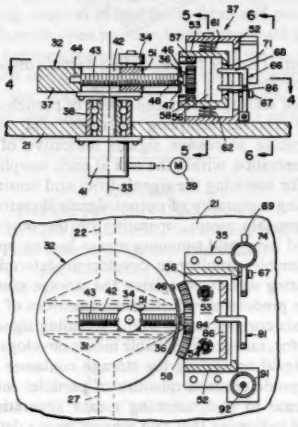
said rotatable member having a slot therein extending radially of said axis,

a screw-threaded shaft having its axis in a plane perpendicular to the axis of said rotatable member,

means mounting said shaft in said slot for permitting rotation of said shaft about its axis while restraining said shaft against endwise movement relative to said slot,

a follower block threaded on said shaft and riding in said slot for translatory movement along said slot in response to rotation of said shaft,

said cam being mounted on said follower block,



a pinion gear fixed to said shaft coaxially therewith, said gear being movable through an orbital path in said plane upon rotation of said rotatable member about its axis,

an arcuate rack member disposed parallel to said orbital path of said pinion gear and spaced from one side of said plane of movement of said pinion gear,

housing means on said frame mounting said rack member for movement towards and away from said plane of orbital movement of said pinion gear,

means for moving said rack member towards and away from said plane and into and out of meshing engagement with said pinion gear.

5. In a container-filling machine as set forth in claim 3, the improvement further comprising:

means for measuring the weight of the material filled into said container and comparing said weight with a reference weight,

and means responsive to a predetermined degree of deviation in the weight of the material filled into said container from said reference weight for actuating said power means to move said rack member into meshing engagement with said pinion gear.

4,065,033

TUBE CONTAINER

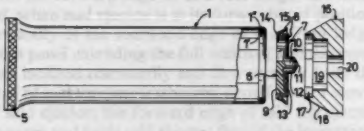
Billy N. Nilson, Mjolby, Sweden, assignor to KeNova AB, Malmo, Sweden

Filed Apr. 2, 1975, Ser. No. 564,551

Claims priority, application Sweden, Apr. 26, 1974, 7405618

Int. Cl.[2] B65D *35/12*

U.S. Cl. 222—107 **6 Claims**



1. A container comprising a tubular member having a first end and a second end, the first end of said tubular member folded inwardly to form a first annular flange at said first end directed toward said second end and defining a first annular space between said first annular flange and said tubular member, a discharge member attached to said tubular member at said first end and being designed to dispense the contents of the container, said discharge member having a peripheral portion with a resilient second annular flange formed thereon having an outer lip portion of unflexed maximum diameter greater than the inner diameter of said tubular member directed toward said first end of said tubular member and defining a second annular space between said resilient annular flange and said discharge member, said resilient annular flange of said discharge member being in resilient contact with the inner surface of said tubular member and with said lip portion sealingly retained in said first annular space, and said first annular flange of said tubular member being retained in said second annular space.

4,065,034

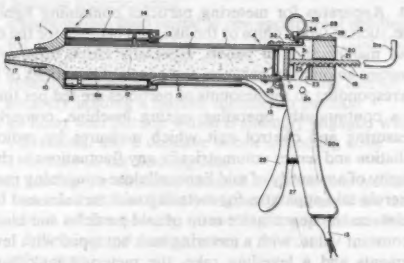
GUN-TYPE DISPENSER FOR HEAT SOFTENABLE ADHESIVE OR SEALANT COMPOUNDS

John E. Callan, Broken Arrow, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed July 30, 1976, Ser. No. 710,068

Int. Cl.[2] B67D *5/62*

U.S. Cl. 222—146 HE **1 Claim**



1. A gun-type dispenser for applying a heat softenable adhesive or sealant compound to a receiving surface therefor, comprising:

a. a barrel having a breech at the inner end and a discharge orifice at the outer end, said breech having an opening therein for the loading of cartridges that is oriented axially with respect to said barrel,

b. electric heating means for heating said outer end of the barrel,

c. breech access means for uncovering said opening in the breech for insertion of a cartridge of said compound into the breech and for closure of said opening following

insertion of a cartridge therein, said breech access means comprising a plunger having a plunger carrier means that is pivotally connected to said barrel whereby said plunger swings outwardly from said barrel for uncovering said opening in the breech, and swings inwardly for closure of the opening following insertion of a cartridge of said compound, said plunger including a toothed portion which extends rearwardly of said barrel, said toothed portion having a set of longitudinally aligned teeth, and further comprising a hand operated, toothed driving element which engages the teeth of said plunger, and wherein said plunger is advanced toward said outer end of the barrel when said driving element is operated, said carrier means for said plunger including a handle, and said driving element being pivotally connected to the handle and hand operable upon gripping said handle, said driving element comprising a pawl and said teeth on the plunger being ratchet teeth, and

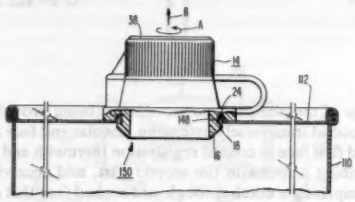
d. mechanical feeding means at the inner end of the barrel for urging the compound of an inserted cartridge into said outer end of the barrel, said feeding means being hand operated.

4,065,035

POURING FITMENT FOR METAL TOPPED CONTAINER

John C. Eissler, Drexel Hill, Pa., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Continuation of Ser. No. 475,981, June 3, 1974. This application July 12, 1976, Ser. No. 704,322
Int. Cl.[2] B65D *25/42*
U.S. Cl. 222—153 **4 Claims**



1. An improved child-proof, closure-container combination comprising:

a plastic closure including

an annular portion extending generally downwardly in a direction substantially parallel to the axis of the closure and having a radially outwardly extending protuberance,

a flange extending radially outwardly from said annular portion above said protuberance and having a downwardly extending projection spaced radially outwardly from said annular portion so as to form an annular groove between the radially inwardly facing surface of said downwardly extending projection and a radially outwardly facing surface of said annular portion above said radially outwardly extending protuberance,

an annular neck extending from said flange and said annular portion and having a dispensing opening at the upper end thereof, and

a cap removably covering said dispensing opening, said cap and said neck including means responsive to the sequential application of torque about the axis of said closure and an axially directed force to remove said cap from said dispensing opening;

a metal container including a metallic member having an opening receiving said downwardly extending annular portion of said plastic closure, said metallic member having a bead extending above said metallic member at said opening and into said groove with the radially innermost portion of said bead extending generally downwardly and having a terminal edge in bitting engagement with said annular portion at said closure at said protuberance; and

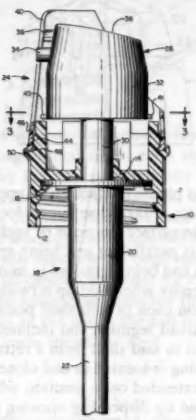
a substantial portion of said radially inwardly facing surface is inclined at an angle less than 10° with respect to said axis and said bead includes a radially outwardly facing surface adjacent said panel juxtaposed to said radially inwardly facing surface and inclined at an angle of less than 10° with respect to said axis.

4,065,036

ACTUATOR CAP HAVING A BUTTON ROTATABLY BETWEEN DISPENSING AND NON-DISPENSING POSITIONS

Donald C. Kirk, Jr., Naugatuck, Conn., assignor to VCA Corporation, Baton Rouge, La.

Filed Dec. 6, 1976, Ser. No. 747,440
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—153 **9 Claims**



1. An actuator assembly for a dispensing device comprising, in combination:

a. a cap means having means for attachment to a container and a series of flat means projecting upwardly from said cap means;

b. an operable dispensing button and means movably mounting said button on said cap means for both turning and axial movement, said button having a series of flat sides, at least one of said sides having tab means thereon, said flat sides and said tab means being arranged to be received within said flat means when properly positioned;

c. cover means enclosing said button adapted to expose a portion of the button for finger engagement; and,

d. guide means on said button and said cover means for preventing relative turning therebetween while enabling relative axial movement to be had.

4,065,037

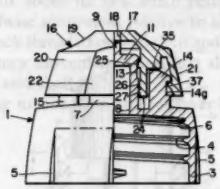
NON-SPURTING TWIST-OPEN DISPENSING CLOSURE

Thomas L. Haller, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 15, 1976, Ser. No. 705,725
Int. Cl.[2] B65D *47/26*
U.S. Cl. 222—153 **12 Claims**

1. A two-piece, non-spurting dispensing closure for a container of the type having a finish, said closure comprising a shell and a tip, said shell having a top portion and an annular skirt for surrounding said container finish, means for attaching said skirt to said container finish, an upstanding cylindrical chimney being located centrally of said top portion of said shell, said chimney having a dispensing passageway extending

axially therethrough and through said top portion of said shell, a cylindrical plug, means for supporting said plug axially and at the upper end of said chimney so as to extend thereabove, a pair of upstanding diametrically opposed posts located on said top portion of said shell to either side of and spaced from said chimney, each of said posts having a thread-receiving groove opening away from said chimney, said tip comprising a top portion and a downwardly depending skirt portion, said top portion of said tip having a dispensing opening located centrally thereof and passing therethrough, said tip having a cylindrical wall surrounding said dispensing opening and depending downwardly from said top portion thereof, said cylindrical wall surrounding said shell chimney and having an inside diameter so sized as to be rotatable about and axially shiftable with respect to said shell chimney, a pair of diametrically opposed inclined planes to either side of said cylindrical wall,



each of said inclined planes contacting an upper edge of one of said shell posts, a pair of thread segments located on diametrically opposed inside surface portions of said tip skirt, each of said thread segments paralleling and being spaced from one of said inclined planes and being engaged in said groove of one of said shell posts whereby when said tip is twisted relative to said shell in one direction each of said shell posts cooperates with its respective tip thread segment and inclined plane to elevate said tip with respect to said shell from a retracted closed position wherein said plug is located in and closes said tip dispensing opening to an extended open position wherein said plug is withdrawn from said tip dispensing opening and when said tip is twisted relative to said shell in an opposite direction each of said posts cooperates with its respective thread segment and inclined plane to lower said tip with respect to said shell from said extended open position to said retracted closed position.

4,065,038

PUMP SPRAYER

Wallace Farnholm Magers, Leawood, Kans.; Larry Lee Hudson, and James Phillip Workman, both of Lee's Summit, Mo., assignors to Realex Corporation, Kansas City, Mo.

Filed Apr. 7, 1976, Ser. No. 674,577
Int. Cl.[2] G01F *11/36*
U.S. Cl. 222—321 **2 Claims**

1. In a hand pump having a tubular plunger and a coaxial valve sleeve on the plunger shiftable freely between port opening and port closing positions in response to relative movement between the plunger and a barrel that telescopically receives the plunger and sleeve in frictional engagement with the sleeve, the improvement comprising:

said plunger having a neck encircled by said sleeve and said neck being of diametrically reduced dimensions with respect to the remainder of the plunger,

said neck including a radially inwardly tapering section at one end thereof and a radially outwardly tapering section at the opposite end thereof,

there being a receiving port in the neck between said sloping sections thereof for communicating the inside of the plunger with the barrel when the sleeve is in its port opening position,

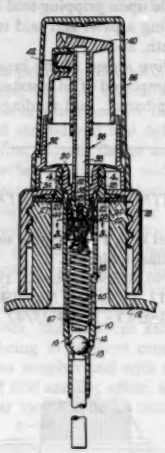
said sleeve being generally hyperbolic in longitudinal cross section, having a radially inwardly bowed inner surface that is generally complemental to the neck of the plunger,

said inner surface of the sleeve having a pair of radially outwardly extending, annular steps therein on opposite sides of said receiving port, presenting a pair of shoulders at the radially inward extent of said steps in position for alternate sealing engagement with the corresponding tapering sections of said neck as the sleeve moves between its port opening and port closing positions,

said plunger being of mutually detachable two-part construction at said neck, a first of said parts containing said inwardly tapering section of the neck and the second of said parts containing said outwardly tapering section of the neck,

said receiving port being located in said second part,

said first part being provided with a first transversely extending annular end face circumscribing the tubular passage of the plunger, said second part being provided with a second transversely extending, annular end face abutting said first face in coaxial registration therewith and circumscribing a recess in the second part, said receiving port comprising a notch through said second face that communicates said recess with the exterior of the plunger,



said second part being provided with a fluted stem projecting out of said recess and into the passage of the plunger, said stem being frictionally retained by said passage,

said second part being provided with an alternative symmetrical set of outwardly tapering section, second annular face, receiving port notch, recess, and fluted stem opposite the aforementioned corresponding components such that said second part may be inverted end-for-end during assembly of the two parts.

4,065,039

SPRING ASSEMBLY FOR FRONT OPENING HOLSTER

John E. Bianchi, and Richard D. E. Nichols, both of Fallbrook, Calif., assignors to Bianchi Leather Products, Inc., Temecula, Calif.

Division of Ser. No. 492,757, July 29, 1974, Pat. No. 3,977,583. This application Apr. 23, 1976, Ser. No. 679,771
Int. Cl.[2] F41C *33/02*
U.S. Cl. 224—2 B **3 Claims**

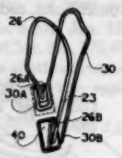
1. A spring assembly for biasing handgun front opening holster sides together comprising;

first and second springs, each including an elongated, generally straight outer end portion, and an intermediate bight portion generally in one plane and an inner end;

the inner ends of said first and second springs defining a plane generally normal to the plane of said respective outer end portion and intermediate bight portions;

means securing said inner ends together whereby said outer

end portions constitute a pair of parallel free ends which define a gap therebetween and cooperate to provide spring resistance to opening of the gap therebetween; and



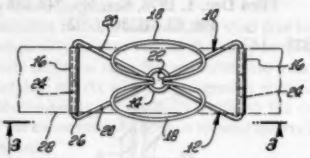
wherein said inner ends each include a reentrant portion of different nestable size.

4,065,040

TENNIS BALL HOLDER

Stephen D. Steere, 6364 Trancas Canyon Road, Malibu, Calif. 90265

Continuation of Ser. No. 545,873, Jan. 31, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,577
Int. Cl.² A45F 5/02
U.S. Cl. 224—5 D **5 Claims**



1. In a belt-mounted tennis ball holder, the combination of:

a. a one-piece upper wire member provided with a central portion formed into a downwardly facing, substantially closed loop having adjacent ends integrally joined to inner ends of laterally extending legs which have downturned outer end portions;

b. a one-piece lower wire member substantially identical to said upper wire member and provided with a central portion formed into an upwardly facing, substantially closed loop having adjacent ends integrally joined to inner ends of laterally extending legs which have upturned outer end portions;

c. first connecting means connecting said downturned outer end portions to said upturned outer end portions, respectively;

d. second connecting means connecting said upper wire member to said lower wire member adjacent the junctions of said ends of said loops with said inner ends of said legs of said upper and lower wire members, said connecting means resisting movement of said loops away from each other; and

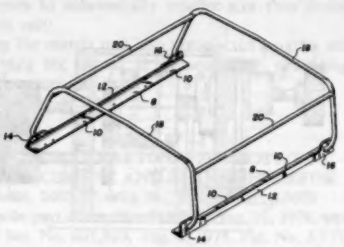
e. the connections between said downturned outer end portions of said upper wire member and said upturned outer end portions of said lower wire member being spaced apart a distance greater than the diameter of said loops, said spaced outer end portions providing a stable base for said loops.

4,065,041

WRAP-AROUND ROOF RACK

Clifford Arnold Stegavig, 1500 6th Avenue E., Prince Rupert, British Columbia, Canada (V8J 1Y2), and David McNair Stringer, 1506 7th Avenue E., Prince Rupert, British Columbia, Canada (V8J 2K3)

Filed June 21, 1976, Ser. No. 698,476
Claims priority, application Canada, June 25, 1975, 230122
Int. Cl.² B60R 9/04
U.S. Cl. 224—42.1 D **7 Claims**



1. A rack for a recreational vehicle having a rear portion formed with a longitudinal sill at each side and including a body supported by the sills and generally enclosing the rear portion, the body having side walls and a roof of relatively poor load-bearing characteristics, the rack comprising:

spaced first and second runners adapted to be located on the longitudinal sills between the body and the sills;

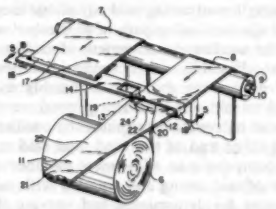
a plurality of load-bearing members for extending upwardly and across the vehicle between the first and second runners externally of the side walls and roof of the body and for carrying loads above the roof.

4,065,042

WEB TRANSPORTING APPARATUS

Erich Zielinski, Bergen, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,952
Int. Cl.² G03B 1/56
U.S. Cl. 226—92 **9 Claims**



1. Web transporting apparatus comprising:

an endless transport element having at least one reduced width section;

means for longitudinally moving said transport element; and

means for connecting a leading portion of a web and said transport element for moving the web with said transport element,

said connecting means including gripper members spaced apart a distance greater than the width of said reduced width section of said transport element to allow said reduced width section to be received between said gripper members, but said distance being sufficiently less than the width of another section of said transport element following said reduced width section to cause said following section to be engaged by said gripper members after said

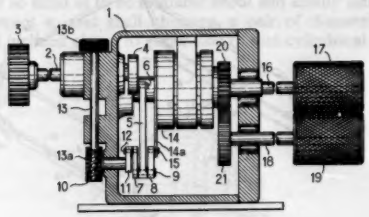
reduced width section is longitudinally moved from between them.

4,065,043

ROTARY SPEED MINUTE REGULATING DEVICE FOR OUTPUT SHAFT IN PULLER APPARATUS

Katsuji Ohashi, 28-2, 1-chome, Yawataya, Osaka, Japan

Filed Apr. 23, 1976, Ser. No. 679,314
Claims priority, application Japan, Apr. 23, 1975, 50-49991
Int. Cl.[2] B65H *17/22*
U.S. Cl. 226—141 **7 Claims**



1. For use with a sewing machine, a cloth pulling apparatus comprising a casing, a rotatable input shaft carried by said casing and adapted for coupling to a rotary drive source, a pair of output shafts carried by said casing and provided with cloth-pulling rotors mounted so as to feed cloth through a nip between rotors when rotated in opposite directions, and variable transmission means within the casing for converting rotary movement of said input shaft to intermittent unidirectional rotation of at least one of said output shafts and cloth-pulling rotors, said transmission means comprising a rod carried eccentrically and pivotally at one of its ends by said input shaft such that rotation of said input shaft effects oscillation of the other end of said rod, a one-way drive member coupled to said output shafts such that oscillatory movement of said one-way drive member effects intermittent unidirectional but respectively opposite rotation of said output shafts, means for effecting oscillatory movement of said one-way drive member in accordance with oscillation of said other end of said rod, adjustable means coupled to said eccentric rod for determining and varying the oscillatory path of said other end of said rod, and manually actuatable means accessible on the exterior of said casing for adjusting said adjustable means so as to adjustably set the oscillating path of said other end of said rod and hence the oscillatory movement of said one-way drive member, said adjustable means comprising a first link mounted for pivotal movement about an adjustably movable center and coupled to said rod such that pivotal movement of said first link about its center determines the oscillatory path followed by said other end of said rod, and said manually actuatable means comprising an adjustment member extending from the exterior of said casing and coupled with said adjustably movable center for determining and varying the location of said adjustably movable center within said casing.

4,065,044

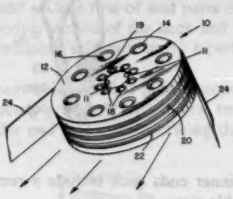
CAPSTAN

Alan Painter, 4276 Lindblade Drive, Apartment 9, Los Angeles, Calif. 90066; Daniel R. O'Neill, 745 24th St., Santa Monica, Calif. 90402, and George L. Glaeser, Jr., 11431 Jo Anne Place, Culver City, Calif. 90231

Filed Dec. 29, 1975, Ser. No. 644,886
Int. Cl.[2] B65H *17/20*
U.S. Cl. 226—188 **5 Claims**

1. In a magnetic tape transport system, a capstan, driven by a capstan motor having a drive shaft, for accelerating a length of magnetic tape, comprising:

a. a monolithic member having a pair of disc-shaped sidewalls and a cylinder-shaped sidewall coupling the peripheries of said disc-shaped sidewalls so that they are parallel to each other, said monolithic member being formed from a metallic material which is substantially thin wherein said capstan is adapted to be coupled to the drive shaft of the capstan motor and each of said disc-shaped sidewalls has a plurality of outer holes, each of said holes being substantially adjacent to the periphery of said disc-shaped sidewall and aligned with one of said outer holes in the other of said disc-shaped sidewalls; and



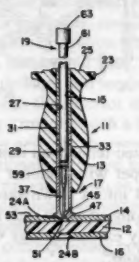
b. a plurality of hollow, cylindrical posts, disposed perpendicular to the plane of said disc-shaped sidewalls in some of said outer holes and coupling said disc-shaped sidewalls together in order to reinforce said capstan.

4,065,045

FASTENER DRIVER TOOL

Winston C. Pray, Lombard, Ill., assignor to Flexible Steel Lacing Company, Downers Grove, Ill.

Filed Dec. 1, 1976, Ser. No. 746,636
Int. Cl.[2] B25C *1/02*
U.S. Cl. 227—147 **6 Claims**



1. In a tool for use in positioning and inserting elongated fastening devices in a workpiece, the improvement comprising expandable housing means defining an elongated bore having a longitudinal axis and extending through said housing means, said bore having a receiving end and a discharging end, elongated laterally expandable chuck means disposed at least partly within said bore in axial alignment with said bore, said chuck means receiving said fastening device, said chuck comprising at least two elongated jaws cooperatively defining an axial bore having a receiving end and a discharging end, the inner diameter of which tapers radially inwardly from a point within said bore toward said discharging end, an orienting means integral with said jaw means for orienting the longitudinal axis of said housing means including a means defining a truncated conical outline at the discharging end of said jaws and a radially outwardly extending shoulder means located above said truncated conical outline, and driver means including a force-receiving end and a driving end slidably received within said chuck means.

4,065,046

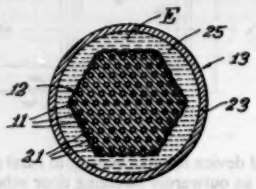
METHOD OF MAKING PASSAGE STRUCTURES

John A. Roberts, North Chelmsford, and Peter R. Roberts, Groton, both of Mass., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 333,112, Feb. 16, 1973, Pat. No. 3,868,792, which is a division of Ser. No. 3,931, Jan. 19, 1970, Pat. No. 3,737,367, which is a division of Ser. No. 778,679, Nov. 25, 1968, Pat. No. 3,506,885, which is a continuation-in-part of Ser. No. 471,123, July 12, 1965, abandoned. This application Dec. 16, 1974, Ser. No. 533,032

Int. Cl.[2] B23P *17/00*; B32B *3/10*

U.S. Cl. 228—156 14 Claims



1. A method of making a passage structure having a plurality of substantially parallel unmachined through passages comprising the steps of:
   1. providing a plurality of sacrificial elongated metal elements each surrounded by a metal tube, the metal of the elements differing from that of the tubes thereby forming a plurality of composite elements;
   2. tightly packing the composite elements in a substantially parallel arrangement;
   3. reducing the arrangement
      i. to consolidate it into a substantially void free body, and
      ii. to subsequently further reduce the body to integrate by solid state diffusion the adjacent tubes into a monolithic metallurgical matrix with a homogenous microstructure and concomitantly substantially diminish the cross section of the elements and the thus formed matrix between the elements;
   4. cutting the body into preselected lengths; and
   5. removing the sacrificial elements from the tubes to define a plurality of unmachined passages.

14. A method of making passage structures having substantially parallel unmachined through passages comprising the steps of:
   1. providing a plurality of sacrificial elongated metal elements each surrounded by a metal tube, the metal of the elements differing from that of the tubes, to form a plurality of composite elements,
   2. tightly packing the composite elements in a parallel manner inside a first enclosure, the packing arranged to achieve a maximum packing density and the enclosure made from the same metal as the tubes;
   3. evacuating the first enclosure;
   4. sealing the evacuated first enclosure;
   5. heating the sealed evacuated first enclosure and its contents;
   6. reducing the sealed evacuated enclosure to
      i. form a void free arrangement eliminating any interstices between the tubes,
      ii. reduce the arrangement in cross section to integrate the tubes into a monolithic first matrix by solid state diffusion, and
      iii. mechanically reduce the cross section of the integrated matrix and the cross section of the elements to a substantially smaller size;
   7. cutting the constricted arrangement into elongated sections of a preselected length;
   8. tightly packing the sections in a parallel manner inside a second enclosure, the second enclosure made from the same metal as the first enclosure and the tubes;
   9. heating the second enclosure and its contents;
   10. reducing the second enclosure to
      i. form a void free second arrangement eliminating any interstices between the elongated sections,
      ii. reduce the second arrangement in cross section to integrate the sections and the second enclosure into a monolithic second matrix by solid state diffusion, and
      iii. mechanically reduce the cross section of the integrated first and second matrixes and the cross section of the elements to substantially smaller size thus forming a matrix unit;
   11. cutting the matrix unit into preselected lengths; and
   12. removing the sacrificial elements thus providing the desired passage structure.

4,065,047

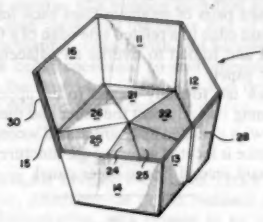
POLYGONAL CARTON WITH BOTTOM REINFORCEMENT AND BLANK THEREFOR

Walter B. Swan, 1400 W. 44th St., Chicago, Ill. 60609

Continuation-in-part of Ser. No. 719,245, Aug. 31, 1976, which is a division of Ser. No. 601,593, Aug. 4, 1975, Pat. No. 3,977,594. This application Sept. 1, 1976, Ser. No. 719,435

Int. Cl.[2] B65D *5/10, 5/36*

U.S. Cl. 229—41 C 16 Claims



1. A polygonal carton having a plurality of side panels and a strong weight supporting bottom formed by a plurality of generally triangular bottom panels equal in number to said side panels and a plurality of interconnecting webs, each web extending between a pair of adjacent bottom panels, each said bottom panel being hingedly connected to one of said side panels, being inclined upwardly from the bottom edge of the side panel to which it is connected so as to form an acute angle therewith, having two side edges which abut adjacent side edges of adjacent bottom panels and having said webs on either side thereof hingedly connecting said bottom panel to an adjacent panel, and each said web having a fold line therein which divides said web into two rib sections and being folded approximately 180° at said fold line to form a double-ply reinforcing rib, at least one of said fold lines extending along a line which is parallel to said side panels and which extends downwardly from a point coincident with the apexes of two adjacent bottom panels interconnected by that web, whereby a load which is placed on said bottom and which urges said bottom panels downwardly will be supported by the locking and bearing engagement between said abutting edges of said bottom panels and by said interconnecting webs.

4,065,048

SELF-LOCKING FLANGED CAP

William M. Pilz, III, Eldridge, Iowa, assignor to Container Corporation of America, Chicago, Ill.

Filed Sept. 29, 1976, Ser. No. 727,717

Int. Cl.[2] B65D *5/64, 43/08*

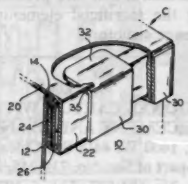
U.S. Cl. 229—43 2 Claims

1. In a self-locking cap, for a tubular container having opposed pairs of side and end walls with integral flanges extend-

ing outwardly and downwardly from the upper edges thereof, the combination of:

a. a generally rectangular top wall having opposed pairs of first and second flanges depending therefrom to form a box-like structure open at the bottom for receiving the upper end of an open top container;

b. each of said flanges including an outer panel, foldably joined at its upper edge to a side edge of said top wall and extending downwardly therefrom, and an inner panel, foldably joined to a lower edge of said outer panel and extending upwardly therefrom on the inside thereof, which form a pocket for receiving a downwardly extending flange of said container;



c. integral retaining means for maintaining said cap and container flanges in interlocking relationship;

d. said retaining means including:

i. opposed pairs of retaining flaps each foldably joined at one end edge to a related side edge of a first flange outer panel and folded to overlie an adjacent second flange outer panel;

ii. a lock tab foldably joined to an upper edge of each retaining flap adjacent the other end thereof and receivable with a related aperture in said second flange, which aperture is located adjacent the juncture of said top wall and said second flange outer panel.

4,065,049

MULTI-LAYER BAG OPEN AT ONE SIDE

Fritz Achelpohl, and Herbert Schmedding, both of Lengerich, Germany, assignors to Windmoller & Holscher, Lengerich, Germany

Filed Dec. 11, 1975, Ser. No. 639,710
Claims priority, application Germany, Dec. 30, 1974, 2461828
Int. Cl.² B65D *33/02*
U.S. Cl. 229—55 **3 Claims**

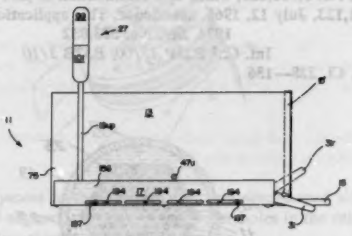
1. A bag open at one side, comprising an outer bag of at least one ply of paper and having a base seam and an inner bag of plastics film provided with a base weld seam at a first end and a Z fold at a second end wherein the first end of the inner bag is securely fastened to the base seam of the outer bag and having a tear-off line of weakness disposed between the base seam of the outer bag and the base weld seam of the inner bag.

4,065,050

SIGNAL DEVICE FOR RURAL TYPE MAILBOXES

Harrell E. Hunt, 152 Oakwood Estates, Scott Depot, W. Va. 25560

Filed Jan. 27, 1977, Ser. No. 763,032
Int. Cl.² A47G *29/12*
U.S. Cl. 232—34 **17 Claims**



1. A signal device for attachement to rural mailboxes of the type having an outwardly swinging door substantially constituting the front end thereof, said signal device comprising elongated frame means for attachment to the lowermost side of the mailbox with the longitudinal axis of said frame means substantially coextending along a front to rear dimension of the mailbox, signalstaff means having lower and upper ends thereto with said lower end thereof being pivotally attached to said frame means for pivotal movement between an upright position and a recumbent cocked position, signalstaff bias means for yieldably urging said signalstaff means toward said upright position, omnidirectional signalhead means attached to said upper end of said signalstaff means for providing conspicuous evidence from any angle of view that the door of the mailbox has been opened, trigger means pivotally attached to said frame means for selectively holding said signalstaff means in said recumbent cocked position when the door of the mailbox is closed and for releasing said signalstaff means as the door is opened, said trigger means including actuating lever means disposed adjacent the door for operable engagement therewith and whereby said trigger means is operated to enable said signalstaff bias means to carry said signalstaff means to said upright position as the door is opened, and lock means for precluding movement of said signalstaff means upon the releasing of said signalstaff means by said trigger means as the door of the mailbox is opened.

4,065,051

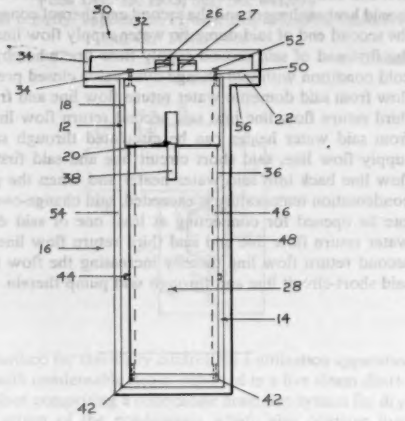
REFUSE CONTAINER

Frederick J. Jones, 2310 Cherry Ridge Lane, Brandon, Fla. 33511

Filed July 1, 1976, Ser. No. 701,523
Int. Cl.² B65D *91/00*
U.S. Cl. 232—43.2 **12 Claims**

1. The refuse container means comprising an upper and lower container member arranged in telescoping relation relative to each other, said upper container member comprising a substantially hollow element having a lid attached to the upper portion thereof, said lid including an aperture formed therein and an access door hingedly attached thereto, said access door movable between an open and closed position to permit selective access to said refuse container when said access door is in said open position, said lower container member comprising a substantially hollow element having a plurality of discharge doors hingedly attached to the lower portion thereof, said hingedly attached discharge doors movable between an open and closed position to permit selective discharge from said refuse container means when said discharge doors are in said open position, and a plurality of cables corresponding to said plurality of discharge doors, each said cables attached to the first hollow element at the upper end and each said cable

attached to said corresponding discharge door at the lower end thereof, said first and second substantially hollow element moveable between an extended and re retracted position such that said discharge doors are moved from said closed position to said open position when said first and second substantially



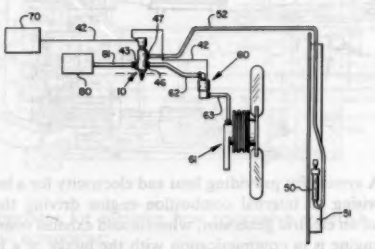
hollow elements are in said retracted position and said discharge doors are moved from said discharge position to said closed position when said substantially hollow first and second element are moved from said retracted position to said extended position.

4,065,052

DUAL ACTION CONTROL MECHANISM

Michael R. Ridenour, Fremont, Ind., assignor to Evans Products Company, Portland, Oreg.

Filed Nov. 4, 1976, Ser. No. 738,836
Int. Cl.² G05D 23/02
U.S. Cl. 236—86 **3 Claims**



1. A dual action control mechanism for supplying fluid under pressure to a first and a second fluid actuatable device comprising:

a. a valve body having an inner end and an outer end;

b. a valve chamber located within said valve body;

c. an opening in said valve body for communicating a ource of fluid under pressure with said valve chamber;

d. an exhaust chamber located at the outer end of said valve body;

e. a connecting passageway communicating the valve chamber with the exhaust chamber;

f. a reciprocal valve rod located within said valve chamber, which said valve rod is reciprocally movable from a first position adjacent the inner end of said valve chamber to a second position removed from said inner end, a portion of said valve rod extending into said connecting passageway and having a passageway therein communicating said valve chamber with said connecting passageway in the first position of said valve rod;

g. a thermal sensor located at the inner end of said valve body, said thermal sensor having a push pin extending into the valve chamber and into contact with the inner end of said valve rod, said valve rod being in its first position when said push pin is unextended and in its second position when said push pin is fully extended;

h. a housing member located at the outer end of said valve body, said housing member having a bore communicating with said exhaust chamber, a reciprocal needle valve located and movable within said bore, said needle valve having a conical head portion at its inner end extending through said exhaust chamber into sealing relationship with the connecting passageway at the first position of said valve rod and into sealing relationship with the passageway of that portion of the valve rod extending into said connecting passageway at said second position of said valve rod, the bore of said housing member communicating with the atmosphere through a peripherally located exhaust port;

i. a first fluid passageway for communicating the valve chamber with a first fluid actuatable device via a solenoid valve;

j. a second fluid passageway for communicating the connecting passageway with a second fluid actuatable device; and

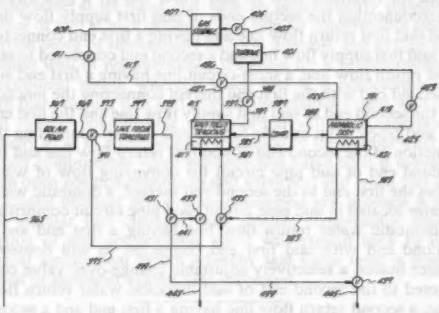
k. a limit switch located at the outer end of said housing member having an actuating pin extending into the bore of the housing member in a position such that at the second position of said valve rod the outer end of said needle valve is in actuating contact with said actuating pin, said limit switch being connected to said solenoid valve for controlling the flow of fluid through said first fluid passageway to said first fluid actuatable device.

4,065,053

LOW COST SOLAR ENERGY COLLECTION SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Charles G. Miller, Pasadena, and James B. Stephens, La Crescenta, both of Calif.

Filed July 24, 1975, Ser. No. 598,969
Int. Cl.² F24J 3/02
U.S. Cl. 237—1 A **17 Claims**



1. A solar energy collection system for producing superheated water, having a plurality of solar energy collection stages, each stage adapted to be most efficient within its temperature range, said system comprising:

a first stage, including a solar pond, for raising the temperature of water from ambient to its predetermined efficiency limit;

a second stage, receiving the water from said first stage and raising its temperature, said second stage including a line-focusing, sun-tracking collection system having at least one combination of a linear primary reflector, a linear

absorber carrying the water therethrough, and a line-imaging secondary reflector for concentrating the energy rays reflected by the primary reflector into a line on said target; and

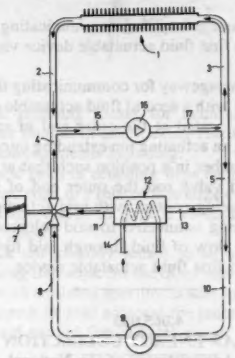
a third stage receiving the water from said second stage and raising its temperature, said third stage including a spot-focusing, sun-tracking collection system having at least one combination of a linear primary reflector, a linear absorber carrying the water therethrough, and a plurality of spot-imaging secondary reflectors for concentrating the energy rays reflected by the primary reflector into spots on said linear absorber.

4,065,054

CIRCULATING WATER HEATER

Hans Meier, Remscheid, Germany, assignor to Joh. Vaillant KG, Remscheid, Germany

Filed June 3, 1976, Ser. No. 692,521
Int. Cl.[2] F24D *3/08*
U.S. Cl. 237—8 R **1 Claim**



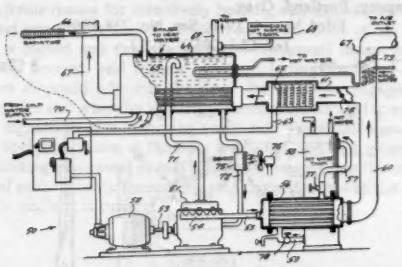
1. A circulating water heater comprising a water heater, a first supply flow line having a first end connected to said water heater and a second end spaced therefrom for conducting flow from said water heater, a first return flow line having a first end connected to said water heater and a second end spaced therefrom for returning flow to said water heater, a pipe circuit interconnecting the second ends of said first supply flow line and said first return flow line and having a first end connected to said first supply flow line and a second end connected to said first return flow line, a short-circuit line having a first end and a second end with the first end thereof connecting the junction of the second end of said first supply flow line and the first end of said pipe circuit and the second end thereof connecting the junction of the second end of said first return flow line and the second end of said pipe circuit for conveying flow of water from the first end to the second end thereof, a domestic water heater located in said pipe circuit, said pipe circuit comprising a domestic water return flow line having a first end and a second end with said first end connected to said domestic water heater, a selectively adjustable change-over valve connected to the second end of said domestic water return flow line, a second return flow line having a first end and a second end with the first end thereof connected to said change-over valve for receiving flow from said domestic water return flow line and with the second end thereof connected to the second end of said first supply flow line and to the first end of said by-pass line, a domestic water supply flow line having a first end and a second end, the first end thereof connected tosaid domestic water heater, a second supply flow line having a first end and a second end with the first end thereof connected to the second end of said domestic water supply flow line and the second end thereof connected to the second end of said first return flow line and to the second end of said short-circuit line, wherein the improvement comprises a pump located in said short-circuit line between the first and second ends thereof, at least one heat exchanger a third return flow line having a first end and a second end with the first end thereof connected to said heat exchanger and the second end thereof connected to said change-over valve, and a third supply flow line having a first end and a second end with the first end thereof connected to said heat exchanger and the second end thereof connected to the second end of said domestic water supply flow line and to the first end of said second supply flow line whereby in the cold condition with said change-over valve closed preventing flow from said domestic water return flow line and from said third return flow line into said second return flow line, flow from said water heater can be circulated through said first supply flow line, said short circuit line and said first return flow line back into said water heater and when the point of condensation temperature is exceeded, said change-over valve can be opened for connecting at least one of said domestic water return flow line and said third return flow line to said second return flow line thereby increasing the flow through said short-circuit line and through said pump therein.

4,065,055

COMPLETE SYSTEM FOR A HOME AIR HEATING AND COOLING, HOT AND COLD WATER, AND ELECTRIC POWER

Michael J. De Cosimo, c/o George Spector, 3615 Woolworth Bldg, 233 Broadway, New York, N.Y. 10007

Filed Jan. 14, 1976, Ser. No. 649,132
Int. Cl.[2] B60H *1/02*
U.S. Cl. 237—12.1 **1 Claim**



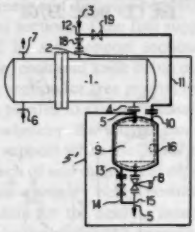
1. A system for providing heat and electricity for a building, comprising an internal combustion engine driving the input shaft of an electric generator, wherein said exhaust manifold of said engine is in communication with the intake of a heat exchanger, including heat exchanging tubes mounted in said heat exchanger, in further combination with water supply means in fluid communication with said exchanger, further including an exhaust gas outlet from said heat exchanger in communication with a second heat exchanger separate from said first heat exchanger, said second heat exchanger being in communication with heating means for the building whereby heat from the exhaust gases is transferred to the heating means for the building via the second said heat exchanger in further combination with ducts from the engine cooling system in communication with said second heat exchanger whereby additional heat generated by the engine is transferred to the second said heat exchanger thereby augmenting the heat transferred to the said means for heating the buildings further including electric coils heating the exhaust gas between the said first and second said heat exchangers whereby the said coils are provided with current from said generator.

4,065,056

METHOD AND DEVICE FOR THERMALLY CONTROLLING A UTILIZATION UNIT FED BY A CONDENSABLE VAPOR DISTRIBUTING SYSTEM

Pierre Eugene Regamey, 33 Plein Soleil, 42580 L'Etrat, France

Filed Dec. 15, 1975, Ser. No. 641,016
Claims priority, application France, Dec. 16, 1974, 74.41374
Int. Cl.[2] F24D 1/08
U.S. Cl. 237—67 16 Claims



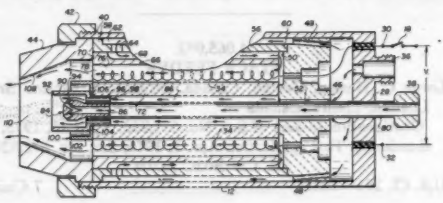
1. A method for thermally controlling a utilization apparatus heated with condensable steam, mounted in a live steam distribution plant comprising a condensate drain line system for dry gravity return of the condensates which also contains live steam, said method consisting in a selectively variable storage of the condensates through modulated retention within said utilization apparatus, wherein the improvement comprises the step of reheating said condensates and permitting said condensates to contact the steam after reheating only.

4,065,057

APPARATUS FOR SPRAYING HEAT RESPONSIVE MATERIALS

George J. Durmann, 97 Intervale Ave., Farmingdale, N.Y. 11735

Filed July 1, 1976, Ser. No. 701,592
Int. Cl.[2] B05B 7/16
U.S. Cl. 239—79 19 Claims



1. Apparatus for spraying heat responsive materials, said apparatus comprising:

a housing having inlet means for a compressed fluid comprising air or inert gas and for the material to be sprayed, and outlet means for a mixture thereof;

a core contained in said housing, said core including heat generating means adapted to be connected to a source of electrical energy, said heat generating means being arranged to heat a first portion of the compressed air or inert gas prior to the discharge thereof;

compressed air or inert gas passageway means in said housing and in communication with said inlet means and said outlet means thereof;

nozzle means in communication with said inlet means for the material to be sprayed; and

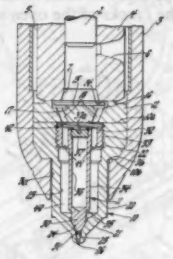
baffle means surrounding said nozzle means for preventing mixing of the heated, compressed air or inert gas and the material to be sprayed until the heated, compressed air or inert gas and the material to be sprayed are downstream of said nozzle means.

4,065,058

FUEL INJECTION NOZZLE WITH COMPRESSIBLE VALVE

Richard S. Knape, and Joseph Lukas, both of Grand Rapids, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 21, 1976, Ser. No. 688,694
Int. Cl.[2] B05B 1/30
U.S. Cl. 239—88 5 Claims



1. A nozzle body with compressible valve assembly for use in a fuel injector nozzle assembly, said nozzle body with compressible valve assembly including a nozzle body having an inlet body portion at one end and a spray tip at its opposite end, said spray tip having fuel outlet means therein, said nozzle body further having a bore extending from said inlet end providing an annular valve seat in said spray tip in fluid communication with said fuel outlet means therein and, a compressible valve positioned in said nozzle body with said compressible valve having a reduced diameter valve head at one end thereof with an enlarged diameter stem extending therefrom, said stem including a tubular compressible stem portion connected to said valve head by an annular radial shoulder, said stem at its opposite end having an enlarged diameter stem end adjustably fixed to said nozzle body against axial movement in either direction and in position in said bore so that said valve head is in loaded abutment against said valve seat, said compressible valve forming with the internal wall provided by said bore in said nozzle body an annular fuel chamber, longitudinally extending fuel passage means in said enlarged stem end in communication at one end with said annular fuel chamber and connectable at its other end with an intermittently supplied source of fuel at high pressure, said tubular compressible stem portion being of substantially uniform diameter and having an annular wall of predetermined thickness for a predetermined longitudinal length whereby when fuel at a predetermined high fuel pressure is in said annular fuel chamber, said wall of said tubular compressible stem portion will be compressed radially so as to effect an axial reduction of the normal length of said compressible valve whereby said valve head is moved to an open position relative to said valve seat and when fuel at a reduced pressure below a predetermined low pressure is in said annular fuel chamber, said tubular compressible stem portion of said compressible valve will expand back to its normal longitudinal length whereby said valve head is positioned in abutment against said valve seat.

4,065,059

REPAIR GUN FOR COKE OVENS

Richard Jablin, P.O. Box 514, Winchester, Va. 22601

Filed Sept. 7, 1976, Ser. No. 721,095
Int. Cl.[2] B05B 13/06; B05C 7/02
U.S. Cl. 239—184 6 Claims

1. A repair gun for spraying repair material into cracks in the walls of a coke oven comprising:

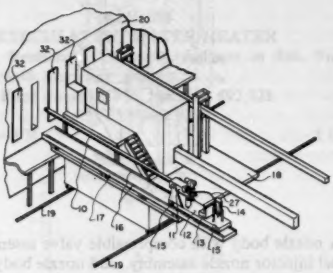
a. A sight tube which is supported at one end by a structure which has power-assisted devices to permit an operator to tilt and rotate said sight tube.

b. A pipe internal to and axially aligned with said sight tube

and terminating in a nozzle at the end of said tube such that refractory repair material may be sprayed through said pipe and nozzle into cracks of the oven walls.

c. A tank for containing the refractory repair material, said tank being equipped for delivering said material through a hose to said internal pipe.

d. A telescope mounted on the operator-end of said sight tube and directed axially along said tube to an angled mirror and through a sight port at the end of said tube such that the operator can observe the deposition of repair material into the cracks of the oven walls.



e. A fan for blowing air through said sight tube to cool said tube, said air leaving at high velocity through said sight port such that particles of refractory repair material are prevented from entering said sight port and clouding said mirror.

f. A power-operated trolley upon which said sight tube, said tank and an operator's control station are mounted such that said trolley may be moved to or away from said oven and said operator may control all motions of said tube and the flow of refractory repair material and, at the same time, observe through said telescope.

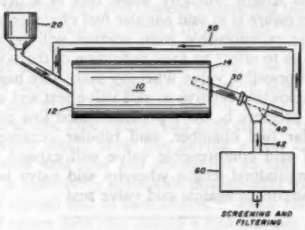
g. A bridge with rails for supporting said trolley.

4,065,060

METAL FLAKE PRODUCTION

A. David Booz, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 6, 1976, Ser. No. 730,181
Int. Cl.² B02C *23/10*
U.S. Cl. 241—16 **17 Claims**



1. A method of forming metal flake from metal particles comprising:

a. charging a ball mill with milling media and with materials to provide a mix therein of said materials comprising approximately 35 to 65 wt.% metal particles, 0.4 to 7 wt.% lubricant, the remainder solvent;

b. operating the mill to form said metal flake;

c. removing a portion of the metal flake, liquid and milling material from the mill at a rate commensurate with said charging thereto; and

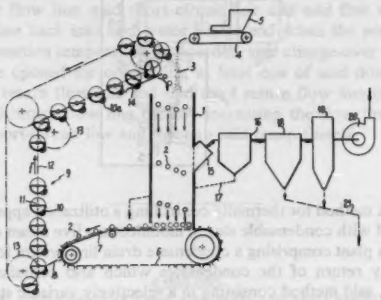
d. separating the milling material from the liquid and metal flake by washing the milling material substantially free of said metal flake.

4,065,061

BALL MILL

Jean-Paul Bombled, 89 bis, rue des Fermettes, 78420 Carrieres sur Seine, France

Filed Dec. 21, 1976, Ser. No. 757,225
Claims priority, application France, Jan. 8, 1976, 76.00309
Int. Cl.² B02C *23/08*
U.S. Cl. 241—81 **4 Claims**



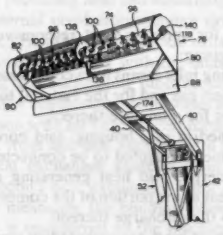
1. A ball crusher comprising a stationary substantially vertical tube, means for feeding the material to be crushed into the upper end of said tube together with crusher balls to drop same into the tube, means for removing said balls and the crushed material out of the lower end of the tube, means for raising the balls thus removed together with any insufficiently crushed material up to the upper end of the tube to return same into the latter and means for separating at least part of the crushed material from the balls at a predetermined point of its travel inside the tube and removing and raising means to discharge said crushed material.

4,065,062

STACK FEEDER

Lorne C. Heslop, Guelph, Canada, assignor to McKee Bros. Limited, Elmira, Canada

Continuation-in-part of Ser. No. 571,833, April 25, 1975, abandoned. This application Apr. 1, 1976, Ser. No. 672,820
Int. Cl.² B02C *13/04*
U.S. Cl. 241—101.7 **7 Claims**



1. A stack feeder for use in association with a stack mover arranged to advance a haystack in a direction longitudinally of the stack feeder, the stack feeder comprising:

a base frame;

a flail assembly located above the base frame and positioned transversely with respect to said longitudinal direction;

means coupling the flail assembly to the base frame for pivotal movement with respect to the base frame about a

horizontal axis so that the flail assembly can be moved up and down along an arcuate path above the frame;

means for moving the flail assembly along said arcuate path;

the flail assembly including: a rotary flail which comprises: an elongate cylindrical support rotatable about a horizontal axis and formed in two cylindrical sections arranged co-axially with respect to one another; axle means rigidly coupling the inner ends of said sections; two stub axles projecting from the respective outer ends of the sections; bearing means on said axle means; a thin plate supporting said bearing means and disposed between the inner ends of said cylindrical sections of the flail support; a plurality of knives carried by said support sections for action on a haystack in use, each said knife being coupled to the associated support section for free pivotal movement about an axis extending parallel to said horizontal axis of rotation of the support, whereby the knives can swing outwardly relative to the support when the flail is in use; a fixed blade assembly on each of said cylindrical support sections, each said fixed blade assembly being positioned adjacent said thin support plate for the bearing means and including a plate secured to the associated support section and positioned in a plane transverse to the longitudinal axis of the support; a plurality of fixed knives attached to and projecting outwardly of said plate, each said knife having an outer end and being positioned so that said end rotates closely adjacent to said thin support plate for the bearing means between the flail sections when the flail is in use; and a hood which extends longitudinally of the flail;

means for rotating the flail at a speed in the range 1,600 to 2,600 r.p.m.; and,

conveyor means supported on the base frame below the flail assembly and extending transversely of the base frame to a discharge location laterally of said frame;

whereby, in use, the leading end portion of a haystack advanced to a position in said arcuate path of the flail assembly is shredded and fluffed up by the action of the rotary flail upon movement of the flail assembly along said path, and the resulting hay is directed downwardly onto the conveyor means for discharge at said discharge location.

4,065,063

IMPACT CRUSHER

Louis W. Johnson, Eugene, Oreg., assignor to El-Jay, Inc., Eugene, Oreg.

Filed July 6, 1976, Ser. No. 702,394

Int. Cl.[2] B02C *13/09*

U.S. Cl. 241—275 **16 Claims**

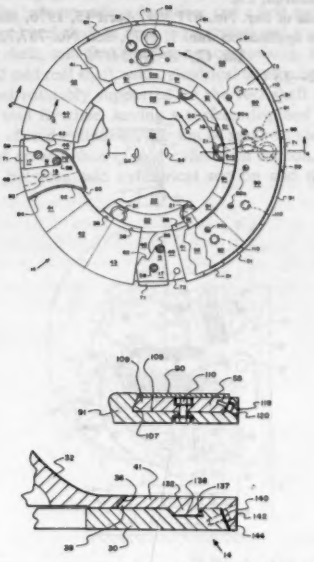
1. In an impact crusher:

a rotatable distributor table,

a plurality of impeller shoes mounted in spaced positions around the distributor table,

and a plurality of segmental wear plates forming portions of an annulus and extending around the distributor table between the impeller shoes,

said table having a groove therearound,



each wear plate having a rib projecting into said groove for retaining purposes.

4,065,064

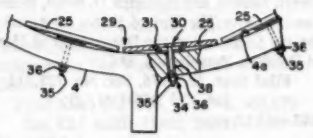
LINERS FOR CRUSHER

James Anthony, Roanoke, Va., assignor to Fuller Company, Catasauqua, Pa.

Filed Oct. 19, 1976, Ser. No. 733,963

Int. Cl.[2] B02C *2/00, 17/22*

U.S. Cl. 241—299 **4 Claims**



1. A wear resistant lining for the bottom shell of a crusher wherein the inside of the bottom shell is a hollow generally truncated cone comprising:

a plurality of wear resistant plates each mounted on the inside of the bottom shell of the crusher adjacent to each other, to thereby encircled the inside of the bottom shell;

each of said plates being substantially flat and having at least one hole therethrough;

a plurality of fastener means, each operatively associated with one of the holes in said plates and the bottom shell of the crusher for securing said plate to the inside of the bottom shell; and

a plurality of universal fittings, each adapted to be positioned in one of the holes in said plates;

each of said fastener means being operatively associated with one of the universal fittings for securing its associated fitting in its respective hole in said plate.

4,065,065

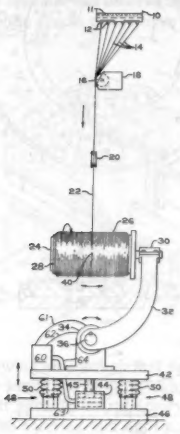
METHOD AND APPARATUS FOR COLLECTING STRAND MATERIAL

John Kallenborn, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 677,359, April 15, 1976, abandoned. This application Jan. 7, 1977, Ser. No. 757,722

Int. Cl.² B65H *54/10*

U.S. Cl. 242—18 G **20 Claims**



1. In a method of forming glass strand comprising attenuating filaments from molten glass through bushing tips in a bushing, gathering the filaments into strand in a gathering means and collecting the strand on a rotating surface, the improvement comprising oscillating the mid point of the rotating surface through an included angle from the horizontal, oscillating the rotating surface in the vertical direction and timing said vertical oscillations in response to said oscillations of the mid point of the rotating surface through the included angle from the horizontal to maintain a constant length of strand between the gathering means and the rotating surface.

4,065,066

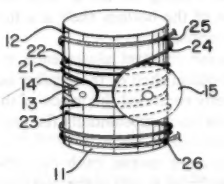
CABLE HANDLING

Alan M. Swett, Milton, and Roderick D. Swift, Belmont, both of Mass., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 30, 1976, Ser. No. 728,312

Int. Cl.² B65H *51/20*

U.S. Cl. 242—47.12 **6 Claims**



1. Cable handling apparatus comprising,

first and second drum means axially displaced along and relatively rotatable about a common axis for carrying flexible cables thereon,

pulley carrier means separating said first and second drum means and relatively rotatable about said common axis with respect to said first and second drum means for carrying pulley means,

first and second pulley means mounted on said pulley carrier means for guiding flexible cables along first and second arcuate paths respectively of different lengths so that said pulley carrier means moves about said common axis as said pulleys guide cables over said arcuate paths,

a first flexible cable having first and second points secured to said first and second drum means respectively and a standing part therebetween guidable over said first arcuate path by said first pulley means,

and a second flexible cable having first and second points connected to said first and second drum means respectively and a standing part therebetween guidable over said second arcuate path by said second pulley means.

4,065,067

SYSTEM FOR AUTOMATIC COUPLING OR SPLICING OF BOBBINS, SUBMITTING A STRIP TO A CONTINUOUS FEED PROCESS FOR PAPER MANUFACTURING MACHINES

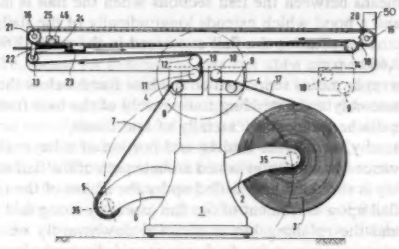
D. Manuel Torres Martinez, Sancho El Fuerte 21-8°C, Pamplona, Spain

Filed Sept. 20, 1976, Ser. No. 724,992

Claims priority, application Spain, Sept. 30, 1975, 441391

Int. Cl.² B65H *19/18*

U.S. Cl. 242—58.1 **10 Claims**



1. Apparatus for continuously supplying paper in sequence without interruption from a plurality of supply rolls comprising:

a. a support frame;

b. said support frame having first and second support means for supporting first and second supply rolls of paper;

c. first and second means for retarding the rotation of said first and second supply rolls of paper respectively;

d. one of said supply rolls supplying paper, the other supply roll being available to begin supplying paper upon the at least partial exhaustion of the paper on said one supply roll;

e. first means for holding the leading edge of paper from said other supply roll adjacent to paper being supplied from said one supply roll;

f. a first roller;

g. said paper being supplied passing over said first roller;

h. said first roller being supported at its first and second ends by first and second arms;

i. said first and second arms being independently pivoted whereby said first roller is free to move in rotation about a common axis and to skew;

j. first and second pressure cylinders having plungers therein connected respectively to said first and second arms;

k. said first and second pressure cylinders being connected to a common source of pressure;

l. at least a second roller;

m. said paper being supplied passing over said second roller;

n. means for controlling translation of said second roller toward said first roller;

o. second means for holding the paper being supplied;

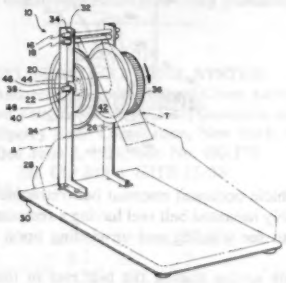
p. means for pressing the leading edge of the paper from said other supply roll against said paper being supplied;
q. means for severing the paper being supplied while it is being held by said second means for holding whereby the supplying of paper is transferred to said other supply roll; and
r. means for returning said second roller to its initial spaced position from said first roller.

4,065,068

ADDING MACHINE TAPE REVERSING REWINDER

John William Treadwell, 8617 Chestnut Oak Road, Baltimore, Md. 21234

Filed Oct. 6, 1976, Ser. No. 730,080
Int. Cl.[2] B65H *17/02, 23/26;* **B41J** *29/00*
U.S. Cl. 242—67.1 R **5 Claims**



1. A reversing rewinder for use with adding machines or the like employing tapes, comprising: horizontal guide means comprising a pair of leveller bars, a spindle assembly having a detachable roll for rewinding and storing tape, the spindle assembly including an axle with the roll slidably mounted thereon and a side plate slidably mounted on the axle at each end of the roll, means for frictionally braking said spindle assembly, a pedestal having upright means for detachably holding the leveller bars and the spindle assembly in parallel spaced relation below the leveller bars, the upright means including a pair of laterally spaced uprights with means defining in each upright a respective aperture, the apertures proportioned for holding the ends of the leveller bars, means defining in each upright a lateral slot with a lip at the lower outboard portion thereof for holding the ends of the axle of the spindle; a base extending forwardly from the pedestal for receiving said an adding machine with a tape having a first side and a reverse side, with the tape first side upward and the tape extending rearwardly and upwardly from said an adding machine through the horizontal guide structure and then downwardly and around the front of the spindle assembly; a knob for rotating the spindle assembly and storing the tape upon the roll with the reverse side of the tape outward, and the reversing rewinder being provided with means for preventing accidental detachment of the spindle assembly in that the side plates are circular and the combined dimension of a side plate radius and the radius of the axle of the spindle exceeds the dimension from the slot lip to the leveller bars and prevents spindle disengagement from said upwardly opening slots.

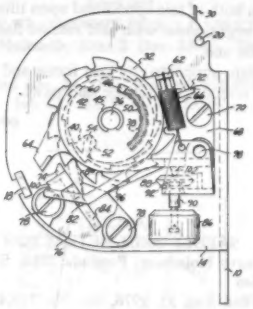
4,065,069

EMERGENCY LOCKING RETRACTOR

Per Olaf Weman, Haslah, Germany, assignor to Sigmatex, A.G., Basel, Switzerland

Continuation-in-part of Ser. No. 342,236, March 16, 1973, abandoned. This application Oct. 1, 1973, Ser. No. 402,448
Int. Cl.[2] A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.4 A **10 Claims**

1. A seat belt retractor comprising: a rotatable reel shaft to which one end of a seat belt is fixed; a rotatable circular ratchet fixed to the reel shaft and rotatable therewith; a locking pawl movable between a first position wherein it allows rotation of the reel shaft in a belt extending direction and a second position wherein it engages said ratchet to prevent rotation of the reel shaft in the belt extending direction; and a first mechanism for locking said reel shaft in response to rotational acceleration of said reel shaft, said first mechanism comprising: a cylindrical section of said reel shaft, said cylindrical section having a face; a flywheel rotatably supported on the reel shaft for rotation thereon, said flywheel having a surface disposed adjacent to said face of said cylindrical section of said reel shaft; a spring supported on said face of said cylindrical section, said spring disposed between said cylindrical section and the flywheel



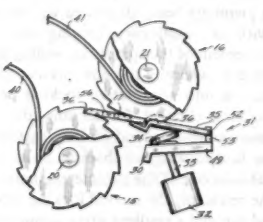
surface, means projecting from said flywheel to said spring so as to urge the flywheel to rotate with the reel shaft when the reel shaft rotates in such a direction as to extend the belt; and actuator means including a locking dog separate from said locking pawl and adapted to be coupled to the reel shaft and to the flywheel and operative to urge said locking pawl into its second position upon the occurance of rotational acceleration of the reel shaft in the belt extending direction, whereby locking forces to prevent rotation of the reel shaft are exerted on said locking pawl, but not on said separate locking dog, thereby enabling said locking dog to be relatively light in weight in comparison to said locking pawl to avoid unbalancing said flywheel.

4,065,070

DUAL SPOOL RETRACTOR

Regis V. Pilarski, Utica, and Gerald A. Yates, Milford, both of Mich., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 18, 1976, Ser. No. 668,070
Int. Cl.[2] A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.4 A **4 Claims**



1. In a multi-spool structure for safety belts and the like, the combination comprising:
a mounting frame;
a pair of spaced-apart spools journalled on said frame, said

spools having webbing retractable thereon and extendable therefrom and the axes of said spools being in spaced-apart parallel relation;

a retractor spring on each of said spools and connected to said frame urging retraction of said webbing onto said spools;

ratchet flanges on said spools confining said webbing therebetween and said ratchet flanges on one of said spools being in planes parallel with the corresponding ratchet flanges of the other of said spools;

a pawl tiltable in said frame between said spools on an axis offset and parallel to the axes of said spools and intermediate said spools, said pawl having plural oppositely facing dogs and said dogs in blocking registry with said ratchet flanges on both of said spools and upon tilting said dogs in blocking engagement with said ratchet flanges of both of said spools; and

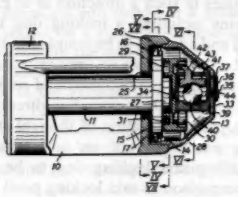
movable means supported by said frame and operably positioned to selectively displace said pawl.

4,065,071

SAFETY BELT RETRACTOR

Gote Eskil Yngve Holmberg, Postlada 2010, S-330 20 Anderstorp, Sweden

Filed Aug. 31, 1976, Ser. No. 719,477
Claims priority, application Sweden, Sept. 2, 1975, 7509720
Int. Cl.[2] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **12 Claims**



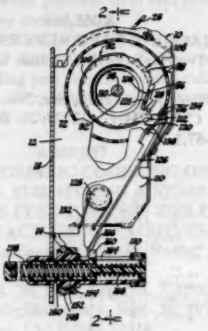
1. A safety belt retractor comprising a frame, a spindle rotatably mounted in said frame; means biasing said spindle in a belt-retracting direction; a non-circular portion formed by said spindle; a first locking mechanism resiliently connected with the spindle for rotation therewith and for displacement thereby between nonrotating locking and rotatable non-locking positions; and including a support; two opposed radially displaceable locking members mounted on the support; bias means biasing the locking members to resiliently engage said non-circular portion of the spindle at slow rotational movements of the spindle; a stationary locking element on the frame, said locking members being displaced by the spindle into engagement with said stationary locking element by a rapid rotational movement of the spindle exceeding the biasing force of the bias means, whereby the non-circular portion cams the locking members into nonrotating locking position with the stationary locking element for locking the spindle against rotational movement; a second locking mechanism cooperating with the first locking mechanism to actuate the first in response to at least one of the parameters inclination and deceleration of the retractor; the second locking mechanism including a toothed rim and a resilient drive connection between the support and the toothed rim; and further including a locking means responsive to inclination or deceleration of the retractor for engaging said toothed rim to thereby prevent said toothed rim from rotating with the spindle and thereby actuate the first locking mechanism.

4,065,072

SEAT BELT RETRACTOR WITH WINDING PREVENTION MECHANISM

Joseph J. Magyar, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 30, 1976, Ser. No. 710,250
Int. Cl.[2] A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107.7 **3 Claims**



1. A vehicle occupant restraint belt retractor comprising:

a rotatably mounted belt reel having a restraint belt attached thereto for winding and unwinding upon belt reel rotation;

a windup spring biasing the belt reel in the belt winding direction, the windup spring providing a winding effort on the belt reel to tension the belt about the occupant when the belt is unwound from the belt reel to an occupant restraining position and provide a winding effort for rewinding the belt to the stored position on the belt reel;

a detent mechanism operatively associated with the reel and normally permitting belt winding reel rotation by the windup spring and being operable to block belt winding reel rotation by the winding spring to hold the belt in a slackened restraining position about the occupant without exerting tension on the occupant;

control means having a control surface coacting with the detent mechanism for controlling operation of the detent mechanism to the blocking position upon operator induced unwinding reel rotation subsequent to the belt being unwound and rewound to a taut restraining position about the occupant, the coaction of the detent mechanism with the control means imparting a frictional force to the reel which impedes belt winding reel rotation and windup of the belt by the effort of the winding spring;

and means responsive to operator actuation to selectively terminate the coaction between the control means and detent mechanism during full windup of the belt to thereby terminate the frictional impediment to belt windup spring whereby the necessary winding effort of the winding spring is minimized.

4,065,073

CREEL CARRIAGE

Joachim Rohner, Monchen-Gladbach, Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Aug. 2, 1976, Ser. No. 711,080
Claims priority, application Germany, Jan. 8, 1975, 2534507
Int. Cl.[2] B65H *49/02*; D02H *1/00*; D03J *5/08*
U.S. Cl. 242—131 **5 Claims**

1. In a creel carriage for warping creels, a plurality of spikes formed as hollow members for receiving textile coils thereon,

the spikes having at the tips thereof respective suction nozzles for sucking the end of a thread wound on a respective textile

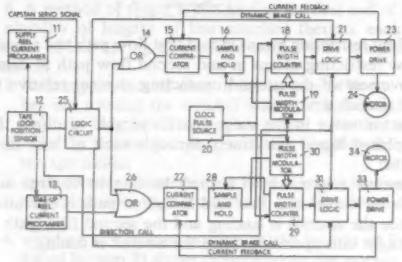
coil into the hollow spike, and means for connecting the hollow spikes to a negative pressuregenerating pneumatic device.

4,065,074

REEL SERVO CONTROL SYSTEM

David Robert Anderson, Murray; Wilbert Cleon Anderson, Salt Lake City, and Vaughn Junior Jenkins, Bountiful, all of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed June 2, 1976, Ser. No. 692,175
Int. Cl.[2] 318 6; G11B 15/58
U.S. Cl. 242—184 **20 Claims**



1. A tape reel servo control system for use in a tape transport system comprising in combination:

a supply reel;

a take-up reel;

a tape drive capstan;

a first vacuum loop box for receiving a tape loop between said supply reel and said capstan;

a second vacuum loop box for receiving a tape loop between said capstan and said take-up reel;

a motor responsive to drive pulses for driving each of said supply and take-up reels;

first means for controlling the acceleration of each of said motors in accordance with the position of a tape loop within its associated loop box; said first means for each of said motors, comprising:

a tape loop sensor means for providing an output indicative of the position of a tape loop within its associated loop box;

current programmer means connected to said tape loop sensor means for providing one of several discrete current levels as an output dependent on the position of said tape loop in its associated loop box;

current comparator means connected to said current programmer means;

feedback means for connecting a feedback signal from the associated motor to said current comparator means;

digital means comprising:

an up-down counter;

a hold circuit connected between said current comparator means and said up-down counter;

a pulse width counter connected to said up-down counter for receiving the counter in said up-down counter at the end of each of said drive pulses;

a clock pulse source connected to said pulse width counter;

said hold circuit causing said up-down counter to count up one or down one at the end of each motor drive pulse depending on whether the current from said current programmer means is greater or lesser than said feedback signal provided by said feedback means; and

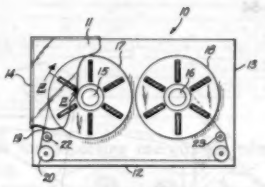
said pulse width counter counting down to zero at the end of each motor drive pulse from the adjusted count registered therein.

4,065,075

TAPE TRANSPORT FOR A CASSETTE

Larry Wayne Holcomb, Rte. 2 Box 130-A, Warrenton, Va. 22186

Filed Apr. 14, 1976, Ser. No. 676,904
Int. Cl.[2] G11B 23/10, 15/60
U.S. Cl. 242—199 **6 Claims**



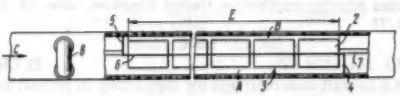
2. A tape cassette including a set of driven reversibly mounted feed and take-up reels wherein each of said reels includes recessed portions in the outer faces thereof, three or more, in multiples of three, equidistantly spaced spring actuated pin rollers located in said portions recessed and extending outwardly from said faces of said reels whereby frictional contact between the cassette and the reels is reduced during tape movement.

4,065,076

PIPELINE FOR PNEUMATIC TRANSPORTATION OF CARGOES IN CONTAINERS

Adolf Moritsovich Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8; Vladimir Efimovich Aglitsky, Zatsepsky val, 6/13, kv. 61; Jury Abramovich Tsimbler, Sojuzny prospekt, 10, kv. 261; Mikhail Vladimirovich Lurie, ulitsa Veernaya, 40, korpus 3, kv. 43; Jury Arnoldovich Topolyansky, ulitsa Matveevskaya, 10, korpus 4, kv. 233; Ilya Solomonovich Kantor, Teplystan, mikroraion 8-a, korpus 10ab, kv. 98; Anatoly Petrovich Chizhikov, ulitsa Petrovka, 26, kv. 3, all of Moscow, and Dmitry Rudolfovich Gun, Komsomolskaya ulitsa, 7, kv. 29, Ljubertsy Moskovskoi oblasti, all of U.S.S.R.

Filed July 9, 1976, Ser. No. 703,838
Claims priority, application U.S.S.R., July 10, 1975, 2154918
Int. Cl.[2] B65G 51/20
U.S. Cl. 243—38 **5 Claims**



1. A pipeline for pneumatic transportation of cargoes in containers and container trains having front and rear half-seals connected by longitudinal seals which cooperate to cause the train to ride on an air cushion, said pipeline having a container breaking zone comprising a bypass pipeline extending substan-

tially transverse to the pipeline and having a gate which closes said bypass pipeline to permit the containers to pass freely through the braking zone and opens during braking of the containers wherein the bypass pipeline is mounted at the beginning of the container braking zone such that one of its ends is connected to only a lower part of the transportation pipeline below the longitudinal seals and the other one, only to an upper part of the transportation pipeline above the longitudinal seals whereby when the container passes through the braking zone and the gate of the bypass pipeline is open, pressure under and above the container is equalized and said container is braked.

4,065,077

ATTACHMENT FOR ATTACHING JET PROPULSION ENGINES TO FIXED STRUCTURE

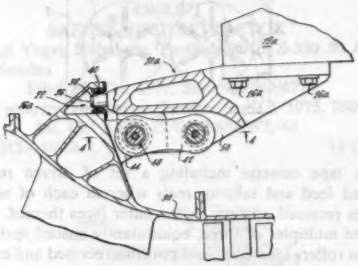
Leslie John Brooks, Aston-on-Trent, England, assignor to Rolls-Royce Limited, London, England

Filed Apr. 25, 1977, Ser. No. 790,609

Claims priority, application United Kingdom, Apr. 30, 1976, 17642/76

Int. Cl.[2] B64D *27/12*

U.S. Cl. 244—54 **5 Claims**



1. Jet engine attachment apparatus comprising a jet engine casing having a boss structure with a projection on its external surface, a bracket adapted for rigid fixing to vehicle structure and having a first portion adapted for close fitting engagement with said boss structure to support a jet engine's weight, a second portion adapted for remote connection with said projection for transmission of jet thrust loads to vehicle structure via the bracket and a third portion adapted to surround said projection in close spaced relationship, so that in the event of breakage of said engaging or connecting features during operation of a jet engine attached to vehicle structure by the apparatus, the jet engine will move to engage said third portion and be restrained thereby.

4,065,078

AIRCRAFT UNDERCARRIAGE SUSPENSION

Stanley Frederick Noel Jenkins, Tarporley; Roy Fairclough, Warrington, both of England; Brian Arthur Howard, Hawarden, Wales, and Frederick Miley, Widnes, England, assignors to Automotive Products, Leamington Spa, England

Filed Mar. 3, 1976, Ser. No. 663,436

Claims priority, application United Kingdom, Mar. 19, 1975, 11520/75

Int. Cl.[2] B64C *25/60*

U.S. Cl. 244—104 FP **21 Claims**

1. An aircraft undercarriage for supporting an aircraft structure comprising:

a ground contacting element;

a variable length liquid-filled strut operatively connected to the aircraft structure and the ground contacting element to support a proportion of the weight of the aircraft structure;

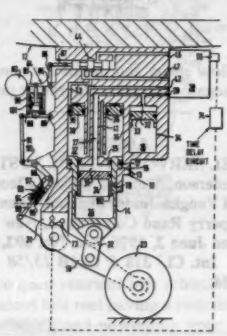
resilient means for controlling the length of said strut in dependence on the load supported thereby;

a first liquid-filled chamber in said strut from which liquid is displaced by upward movement of the ground contacting element relative to the aircraft structure;

a second liquid-filled chamber closed by a movable wall acting on said resilient means in a direction to increase the load thereon under the pressure of liquid displaced from said first chamber;

a valve block;

first and second flowpaths defined by the valve block connecting said first chamber and said second chamber;



first flow restricting means in said first flow path and second flow restricting means in said second flow path to damp movement of the ground contacting element relative to the aircraft structure;

a selector valve in the valve block operable to direct the displaced liquid selectively through each of said flow paths;

and means responsive to aircraft landing to control said selector valve such that said first flow path is operative while the aircraft is landing and the second flow path is brought into operation when the aircraft is taxiing.

4,065,079

PARACHUTE REEFING DEVICE

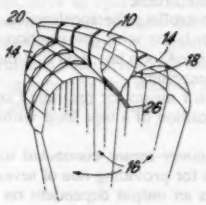
Christopher John Winchurch, Biggleswade, England, assignor to Irvin Great Britain Limited, Letchworth, England

Filed Mar. 1, 1976, Ser. No. 662,296

Claims priority, application United Kingdom, Mar. 5, 1975, 9184/75

Int. Cl.[2] B64D *17/08*

U.S. Cl. 244—152 **15 Claims**



10. A parachute having a plurality of gores extending radially from a central region thereof and including smoothly releasable reefing means for securing together normally spaced parts of the canopy thereof as a reefed section in a first stable stage of canopy development wherein the canopy thereof is reduced in size by the elimination of said reefed section thereof intermediate said parts as an effective drag area of said parachute, said reefed section comprising at least one of said gores,

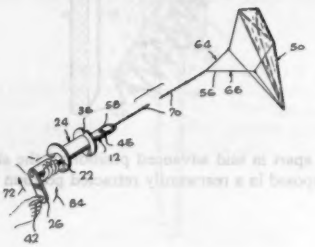
and release means operable independently of the forces of inflation of said canopy for releasing said reefing means after said first stable stage of canopy development to allow said reefed section thereof to smoothly inflate and providing a second stable stage of canopy development wherein the canopy is fully developed.

4,065,080

KITE REEL SYSTEM

Dave R. Alison, 21102 Brighton Ave., Torrance, Calif. 90501

Filed Nov. 26, 1976, Ser. No. 745,046
Int. Cl.² B64C *31/06*
U.S. Cl. 244—155 A **10 Claims**



6. A method of flying a kite having the first end of each of a plurality of lengths of line attached thereto, each of the lengths of line having an opposite second end, comprising the steps of:

1. securing the second ends of the lengths of line to a member and rotating the member while the kite is in flight to twist the lengths of line together over a portion thereof;
2. winding the twisted portion of the lengths of line onto storage means;
3. again rotating the member to twist at least a portion of any remaining untwisted portion of the lengths of line together;
4. winding any twisted portion of the lengths of line produced by step 3) above mounted onto the storage means; and
5. repeating steps 3) and 4) above as necessary until the lengths of line are substantially completely twisted together and wound onto the storage means.

8. A kite reel system for use with a kite having two different lengths of line coupled thereto comprising:

an elongated structure rotatable about an axis along the length thereof;

handle means extending along a portion of the length of the elongated structure;

line storage means encircling the elongated structure at a location along the length thereof; and

means for releasably coupling two different lengths of line to the elongated structure, and including means for temporarily securing a twisted portion of the two different lengths of line at or adjacent said axis.

4,065,081

ALTERNATING CURRENT TRACK CIRCUITS

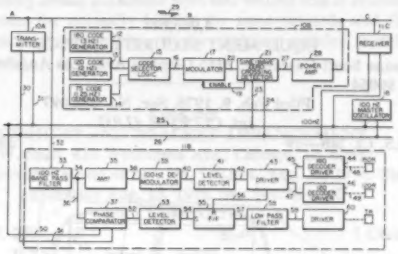
Jerry P. Huffman, Churchville; John P. LaForest, Conesus; William A. Petit, Rochester, and James A. Smith, Conesus, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,144
Int. Cl.² B61L *23/16*
U.S. Cl. 246—34 R **5 Claims**

1. Alternating current track circuits for several adjoining track sections of a stretch of railway track, each of the track circuits comprising an alternating current code transmitter and an alternating current code receiver connected to track rails at opposite ends of an associated section for detecting track occupancy, for communicating signal control rate codes through the track rails and for detecting broken down insulating rail joints which may be used to define boundaries of the several track sections, wherein improvements in the track circuit for each track section comprise;

a. circuit means including an alternating current line circuit extending along the stretch of railway track for normally communicating alternating current from the line circuit at a selected modulated rate code through rails of the associated track sections, current in any two adjoining track sections being of opposite instantaneous polarity for broken down joint protection, and

b. the circuit means comprising means responsive to the rate coded alternating current communicated through the



track rails for governing energization of a track relay comprising,

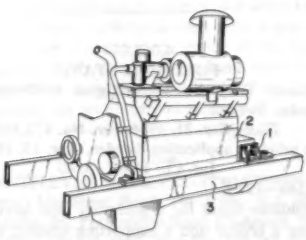
1. phase sensing means including comparator means for comparing the rate code modulated alternating current communicated through the track rails with a steady reference source connected to the line circuit and for generating an output rate code pattern comparable to modulations in the track rails only provided that the alternating current in the track rails is substantially 180° out-of-phase with the reference source of the associated track circuit, and 2. means including a flip-flop circuit and a low pass filter for energizing the track relay only in response to the direct current rate code pattern output of the phase sensing means.

4,065,082

ENGINE MOUNTING APPARATUS

Shingo Oota, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 21, 1976, Ser. No. 734,633
Claims priority, application Japan, Oct. 23, 1975, 50-143644
Int. Cl.² B60G *11/18*
U.S. Cl. 248—9 **3 Claims**



1. An engine mounting apparatus adapted to absorb engine vibrations in every direction comprising a base frame of a vehicle, a bracket for mounting the engine on said base frame, a first bolt means extending through a first aperture in said

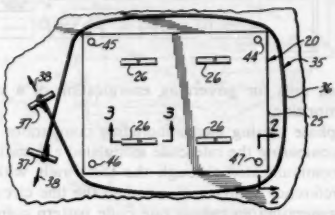
bracket and having a washer for fastening said bracket against said base frame, a first spacer disposed coaxially about said first bolt means, a cushion rubber disposed coaxially about said first bolt means and said first spacer between said washer and said base frame for holding said bracket, a second bolt means provided in spaced relation with said first bolt means extending through a second aperture in said bracket, and a second spacer disposed coaxially about said second bolt means, a clearance being provided between said second aperture in said bracket and the outer periphery of said second spacer, said clearance being large enough to allow vibration of said bracket during the normal running condition of the engine and small enough to allow collision of said bracket against said second spacer when excessive vibration of the engine occurs.

4,065,083

EQUIPMENT SECURITY DEVICE

James Scott Gassaway, 2356 Glendon Ave., Los Angeles, Calif. 90064

Filed Feb. 9, 1976, Ser. No. 656,097
Int. Cl.² F16B *41/00*
U.S. Cl. 248—19 **30 Claims**



1. Garrot-resistant means for use with apparatus for holding equipment to a surface, said apparatus having plate means to which the equipment is attachable, an adhesive bond means on the bottom of said plate means for attaching the plate means to said surface, said garrot-resistant means comprising: at least three cut-resistant bodies attachable to the said surface independently of and adjacent to said plate means, each body being of sufficient length as to extend from at least substantial contiguity with said surface to an elevation above said bottom of said plate means, at least one of said bodies being disposed off of a line drawn between two of the other bodies, whereby to form a pattern which will exclude a garrot wire from cutting through said adhesive bond means to permit the plate means to be cut loose from the surface, or through sufficient of said adhesive bond means to permit the plate means readily to be broken loose from the said surface.

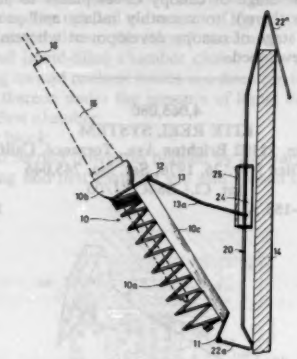
4,065,084

FOLDABLE STAND

Hans Wiener, Taby, Sweden, assignor to Pressmaster Ltd., Stockholm, Sweden

Filed Mar. 31, 1976, Ser. No. 672,335
Claims priority, application Sweden, Apr. 15, 1975, 7504281
Int. Cl.² D06F *75/40*
U.S. Cl. 248—117.1 **10 Claims**

1. A foldable stand for a soldering iron having a handle, comprising a holder and a supporting bracket therefor, said holder having a rear end articulated to said bracket and a front end forming a seat for said handle, said bracket having a pair of forwardly converging flexible arms; a slider shiftably engaging said arms; and a link pivotally connecting said front end with said slider for drawing said seat toward said bracket upon a rearward shifting of said slider from an advanced position in which said seat is separated from said bracket by a distance approximating the length of said link, said arms having free



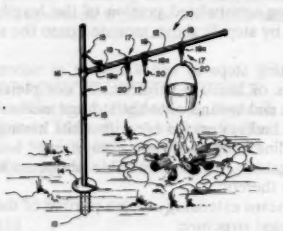
ends spread apart in said advanced position of the slider but closely juxtaposed in a rearwardly retracted position thereof.

4,065,085

FIRE PIT HANGER

Walter L. Gellatly, 350-35th St., Ogden, Utah 84403

Filed Sept. 30, 1976, Ser. No. 728,310
Int. Cl.² A47J *37/00*; F24B *3/00*
U.S. Cl. 248—124 **3 Claims**



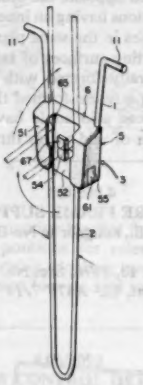
1. A pit fire hanger comprising
an upright support post having an open upper end;
a collar closely fitting around and slidable on said support post;
a support arm fixed to and cantilevered outwardly from said collar;
a plurality of holes spaced along the length of the support post, each said hole having a vertical portion extending axially of the post and a transversely extending portion at a lower end of the vertical portion and extending partially around the post; and
a plurality of hangers carried by and slidable along said support arm, each said hanger including a hook adapted to be suspended from said support arm and at least one said hook being adapted to selectively engage the upper end of the support post or one of said plurality of holes to prevent movement of said collar axially along the post while allowing pivoting movement of said arm with respect to said post.

4,065,086

LEG ASSEMBLY FOR A BABY'S GO-CART

Shinroku Nakao, Yokohama, Japan, assignor to Combi Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1976, Ser. No. 717,422
Int. Cl.[2] A47D *13/04*
U.S. Cl. 248—188.6 1 Claim



1. A foldable leg assembly for a baby's go-cart comprising an upper member, a lower member and a connecting member; said upper member being generally U-shaped, said lower member having two legs biased away from one another at the upper end thereof and terminating in outwardly extending pivotal posts; said connecting member comprises in combination an outer frame and an inner frame, each of hard synthetic resin, said outer frame having the form of a box with a bottom and having in the central lower half of a front wall thereof a recessed wall, said front wall and said recessed wall coming together and defining facing grooves for receiving said legs respectively of said lower member, said inner frame shaped to fit into said outer frame and having a groove whose section is like a letter "C", said latter groove being adapted to engage with the cross portion of said U-shaped upper member, and having a pair of elongate grooves formed along both sides of said latter groove for receiving the vertically elongated parts of said upper member therein, and having a pair of pivot grooves for fitting said pivotal posts therein provided near the lower end portion of a front wall of said inner frame whereby the squeezing together of said two legs frees said legs from said grooves in said outer frame to permit pivoting of said lower member about said pivotal posts so that said leg assembly can be folded.

4,065,087

MOUNTABLE ATTACHMENT

LeRoy Solden, St. Peter, Minn., assignor to Widen Tool & Stamping, Inc., St. Peter, Minn.

Filed July 15, 1976, Ser. No. 705,414
Int. Cl.[2] A47B *96/06*
U.S. Cl. 248—201 5 Claims

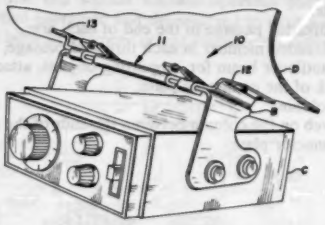
1. A mountable attachment device for mounting accessory items in vehicles and the like, such device including:

a. a first plate member, generally rectangular in shape and including an upstanding lip member along at least a portion of one of the longitudinal sides of said plate to provide a first article retaining element, said lip member being angularly directed to overlie said plate;

b. means for attaching said plate member to a supporting surface;

c. track means including at least a pair of spaced passages through said plate and being arranged transversely with respect to said first article retaining element

d. second article retaining means being arranged in said track means including at least a pair of lip members which lip members are angularly directed to overlie said plate and being directed towards said first retaining element; and,



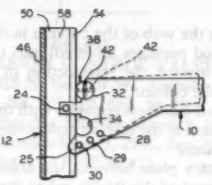
e. biasing means associated with said second article retaining means for normally biasing the same towards said first article retaining element for holding articles therebetween.

4,065,088

UPRIGHT AND BRACKET ARRANGEMENT

Irving W. Shell, 422 Wellington Ave., Chicago, Ill. 60657

Continuation-in-part of Ser. No. 500,574, Aug. 26, 1974. This application Aug. 13, 1975, Ser. No. 604,145
Int. Cl.[2] A47G *29/02*
U.S. Cl. 248—242 7 Claims



1. In an upright support member and bracket, said bracket comprising:

a first abutting means for contacting the inside of said support member;

a second abutting means for contacting the outside of said support member, the cooperation of said first and second abutting means enabling the vertical position of said bracket to be incrementally varied along the length of said support member;

a third abutting means for contacting the outside of said support member for finely setting the slant of the bracket and locking it in position; and

said support member including a rear wall, opposed side walls and a flange extending inward from each of the side walls to define a gap therebetween, said walls and flanges defining a channel communicating with a gap, said first abutting means contacting the inside of the flanges and spanning the width of said gap, and said second and third abutting means contacting the outside of the flanges and also spanning the width of said gap.

4,065,089

CANTILEVER RACK CONSTRUCTION

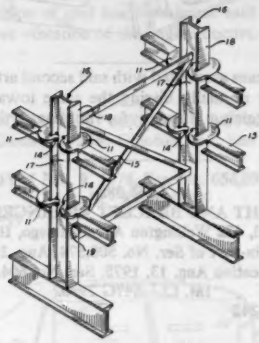
Donald Frazier, Mendham Road, Far Hills, N.J. 07931, and John R. Hardin, Jr., Pottersville Road, Gladstone, N.J. 07934

Filed Mar. 9, 1977, Ser. No. 775,742
Int. Cl.[2] A47B *96/12*
U.S. Cl. 248—245 19 Claims

1. A cantilever rack construction comprising:

a. a rigid, horizontally disposed connector plate for securing a cantilever beam to a column,

b. a pair of integral, rigid arms on the front of the connector plate,
c. the arms converging toward each other, and embracing an elongated space between the arms and the connector plate,
d. a threaded passage in the end of each arm,
e. a threaded member in each threaded passage,
f. a cantilever beam for supporting objects, attached to the back of the connector plate,
g. a column,
h. a web on the column between the ends of the arms of the connector plate,



i. a flange on the web of the column in the elongated space,
j. the threaded passages directed, into the elongated space generally toward the intersection of the web with the flange of the column,
k. the threaded members engaged with the back of the flange of the column at the intersection of the flange and the web of the column,
l. the connector plate between the arms being in abutment with the front of the flange, when the threaded members are tightened.

4,065,090

CLIP ASSEMBLY FOR CEILING TRACK RAILINGS

Harold D. Mauney, 2095 Laura Lane, West Palm Beach, Fla. 33406

Filed Mar. 5, 1976, Ser. No. 664,090
Int. Cl.[2] B42F *13/00*; A44B *21/00*
U.S. Cl. 248—318 **2 Claims**

1. A clip assembly formed out of a single piece of substantially rigid material for suspending objects from ceiling track railings having flat ceiling supporting surfaces, said clip comprising:
a. opposed side walls and an end wall joining one end of each of said side walls, said side walls extending substantially their entire length at an angle relative to each other, the other end of each of said side walls having an end portion formed inwardly thereof such that the end portion of each side wall is disposed opposite the other and spaced therefrom, said end portions having an inner surface area which is flat and which lies in the same plane for engaging said flat ceiling supporting surfaces of said track railing, and
b. web means integrally formed with said end wall, said web means having a recess formed therethrough for suspending said objects, said angle having a vertex at the approximate center of said recess through said web.

4,065,091

PICTURE FRAME SUPPORT

John Ulrich, Chicago, Ill., assignor to Nu-Dell Plastics Corporation, Chicago, Ill.

Filed Dec. 13, 1976, Ser. No. 750,284
Int. Cl.[2] A47F *7/14*
U.S. Cl. 248—473 **6 Claims**

1. A combination picture frame and stand therefor comprising
a. an open-back rectangularly shaped frame having a transparent face defined by a laterally extending peripheral flange,
b. a base support substantially triangular in cross section presenting horizontal bottom edge surfaces and an inclined upper face,
c. forwardly projecting leg members formed from opposite side walls of said base support providing continuous horizontal bottom edge surfaces and substantially flat frame-supporting surfaces extending coplanar with said inclined upper face of said base support,
d. means extending in a spaced parallel relation to said leg members of said base cooperating with said frame-supporting surfaces for frictionally holding a portion of said peripheral flange of said frame thereon so as to support said transparent face of said frame vertically from said inclined upper face of said base.

4,065,092

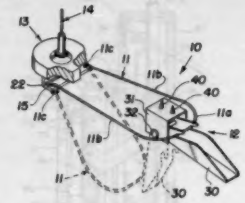
QUICK RELEASE SECURITY LATCH DEVICE FOR RADIO ANTENNA BASE

Maurice H. Spinks, Sr., and Yvon E. Juge, both of Fort Worth, Tex., assignors to SouthCom, Inc., Fort Worth, Tex.

Filed Apr. 12, 1976, Ser. No. 675,996
Int. Cl.[2] B65J *1/22*
U.S. Cl. 248—503 **2 Claims**

1. A security latch device for quickly releasably mounting and removing a radio antenna base upon supporting structure of a vehicle comprising: a clamping loop connectible with said radio antenna and base and movable between a tensioned locking condition and a relaxed release condition; and a tension lever assembly securable with said supporting structure of said

vehicle including a mounting bracket formed by a channel shaped member having a central portion adapted to be secured with said vehicle supporting structure and a tension lever formed of a channel shaped member having locking recess means for engagement by said clamping loop and pivotally



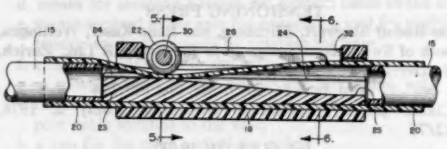
secured within said mounting bracket for movement between locking and release positions for releasably engaging said clamping loop for imposing a locking tension on said clamping loop to hold said antenna base on said supporting structure of said vehicle.

4,065,093

FLOW CONTROL DEVICE

Thomas E. Phillips, Ingleside, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 24, 1976, Ser. No. 689,321
Int. Cl.[2] F16K *7/06*
U.S. Cl. 251—6 **12 Claims**



1. A flow control device for establishing a desired flow rate in a fluid flow system comprising, in combination:

a conduit having a resilient wall;

a generally cylindrical insert member disposed within said conduit, said insert member including an axially-extending depression of uniform cross-section;

a flow bypass channel of progressively increasing cross-sectional area along the axis of said depression, said depression and channel defining in conjunction with said resilient wall a fluid passage through said conduit communicating with the ends of said conduit; and

flow control means for forcing the wall of said conduit into said depression at a desired location along said axis to restrict flow in said fluid passage to a predetermined underlying portion of said flow bypass channel thereby providing said desired flow rate.

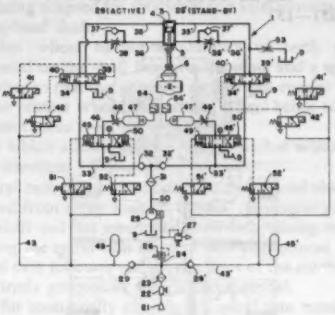
4,065,094

HYDRAULIC ACTUATOR

Ted Adams, Cleveland Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Aug. 19, 1976, Ser. No. 715,983
Int. Cl.[2] F16K *31/12*; F15B *18/00, 20/00*
U.S. Cl. 251—26 **33 Claims**

1. A self-contained hydraulic actuator comprising a housing adapted to be secured to a valve housing for opening and closing said valve by hydraulically actuating a movable valve member is said valve housing; said actuator housing comprising a hydraulic motor having a hydraulically-actuated component adapted to be secured to said valve member, a reservoir, an air-driven hydraulic pump, and an air-piloted directional control valve operatively interconnected together for fluid pressure actuation of said component selectively in opposite directions in response to operation of said directional control valve; and first and second solenoid-operated pilot valves operative when energized and deenergized to vent and pressurize a first pilot air chamber in said directional control valve



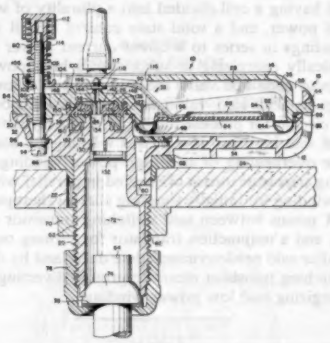
and to pressurize and vent a second pilot air chamber in said directional control valve to actuate said component to respectively open and close said valve; said actuator housing having an air pressure inlet port communicating with said pump and said first and second pilot valves.

4,065,095

FLUID LEVEL CONTROL VALVE

Dwight N. Johnson, 325 N. Bell Air St., Anaheim, Calif. 92801

Continuation of Ser. No. 550,220, Feb. 18, 1975, abandoned, which is a division of Ser. No. 339,548, March 9, 1973, Pat. No. 3,895,645. This application Sept. 1, 1976, Ser. No. 719,817
Int. Cl.[2] F16K *47/02*
U.S. Cl. 251—118 **9 Claims**

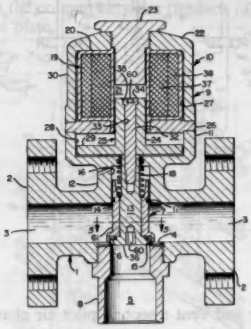


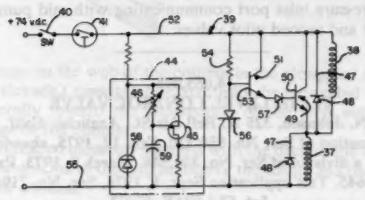
1. A valve comprising a housing having a generally annular valving surface surrounding a generally annular valve seat, an inlet passage communicating with the radially inner side of said valve seat, said surface lying in a plane generally transverse to the axis of said inlet passage, said surface including a plurality of rib portions extending generally radially outward from said valve seat, and defining between adjacent ribs a plurality of valve outlet passages extending from said valving surface in a direction generally parallel with the axis of said inlet passage, said passages terminating at said valving surface in outlet ports coplanar with said valving surface, said ports having increasing widths in the radially outward direction, and a flexible annular valve member having an inner periphery overlying said valve seat, an outer periphery fixed against said valving surface, and an intermediate portion engageable with said valving surface and overlying said outlet ports.

4,065,096
SOLENOID-ACTUATED VALVE

Virgil L. Frantz, Salem, and Thomas D. Taylor, Roanoke, both of Va., assignors to Graham-White Sales Corporation and Graham-White Manufacturing Co., both of Salem, Va.

Filed July 1, 1976, Ser. No. 701,514
Int. Cl.[2] F16K *31/06*; H01F *7/18*
U.S. Cl. 251—137 6 Claims





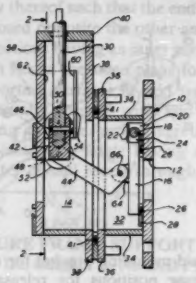
1. A solenoid-actuated valve, comprising a valve member, a solenoid having a coil divided into a plurality of windings of different power, and a solid state control circuit connecting said windings in series to a direct current power source for automatically energizing in succession a high power of said windings to open said valve member and a low power of said windings to hold said valve member in open position, said control circuit, for predetermining a time delay between energizing of said high and low power windings of a duration to preclude overheating of said high power winding, including switching transistor means connected in parallel with said low power winding for initially shunting current therepast, initially off SCR means between said switching transistor means and ground, and a unijunction transistor for turning on said SCR means after said predetermined time delay and by discharging said switching transistor means to ground diverting current to and energizing said low power winding.

4,065,097
SLOT SEALING VALVE FOR VACUUM COATING APPARATUS

Mitchell E. Timin, Berkeley, Calif., assignor to Airco, Inc., Montvale, N.J.

Filed May 17, 1976, Ser. No. 686,851
Int. Cl.[2] F16K *13/00*
U.S. Cl. 251—228 8 Claims

1. In equipment for vacuum coating substrates including a vacuum chamber having an access opening in a wall thereof through which a substrate can be moved, an apparatus comprising: a sealing valve for said opening pivotally mounted to open for substrate clearance and to close for making a vacuum-tight seal, means for actuating the valve, guide roller means pivotally mounted on the valve actuating means, fixed guide means for guiding the roller means for reciprocal movement along a linear path, and a thrust member mounted co-pivotally with the roller means for interconnecting the actuating means and the valve defining a line-of-thrust therebetween, the acute angle between the line-of-thrust and the line of motion of the actuating means increasing toward 90° as the valve approaches

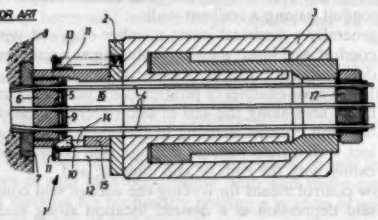


its closed position, whereby the ratio of linear travel of the actuating end of the thrust member to the arcuate travel of the valve-connected end thereof increases materially during the final closing and valve-sealing movement of the thrust member.

4,065,098
WEDGE PUSH-IN APPARATUS FOR A WIRE TENSIONING PRESS

Hans-Rudolf Siegwart, Kilchberg, and Rene Kaser, Wettingen, both of Switzerland, assignors to Bureau BBR Ltd., Zurich, Switzerland

Filed June 16, 1977, Ser. No. 807,294
Claims priority, application Switzerland, July 2, 1976, 8512/76
Int. Cl.[2] E21B *19/00*
U.S. Cl. 254—29 A 10 Claims



1. In a wedge press-in apparatus for a tensioning press for tensioning a bundle of wires, the individual wires of which can be anchored by means of wedges in an anchoring head, a wedge push-in plate serving to push-in the wedges, the improvement which comprises:

push-in elements for actuating the wedge push-in plate;

means providing a common, lengthwise displaceable support movable out of a starting position;

means mounting the push-in elements at said common, lengthwise displaceable support means for movement between a rest position and a work position;

said push-in elements being mounted at said support means such that with said support means in its starting position said push-in elements do not extend into the interior of the wedge push-in apparatus; and

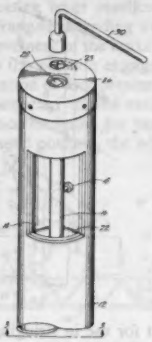
means for placement of the push-in elements into their work position for actuating the wedge push-in plate.

4,065,099

IN-POST TENNIS NET TIGHTENER

Stanley A. Germain, Glendale, Calif., assignor to L. A. Steelcraft Products, Inc., Pasadena, Calif.

Filed Jan. 2, 1976, Ser. No. 646,079
Int. Cl.[2] A63B *61/04*
U.S. Cl. 254—164 3 Claims



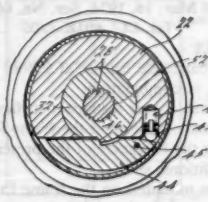
1. A tamper-proof tennis net tension mechanism comprising:
a. an open ended support pole for a tennis net;
b. an open ended cylindrical casing within the pole substantially axially aligned with the pole, and wherein the pole open end and casing open end face in the same direction;
c. an axle coaxial with the casing inside the casing and rotatably supported thereby;
d. means for securing a tennis net support cable to the axle;
e. means secured to the axle for engaging a tool for applying tension to the tennis net by rotating the axle;
f. a ratchet connected to the axle;
g. a pawl secured to the casing and engagable with the ratchet to prevent release of tension on a tennis net support cable secured to the axle;
h. a cap for the open end of the pole;
i. an opening in the cap for access to the means for engaging the tension applying tool;
j. an opening in the cap for access to the pawl for disengaging the pawl from the ratchet; and
k. openings in the pole and the casing for access to the means for securing a net cable to the axle.

4,065,100

HOIST LOAD BRAKE

Michael M. Walsh, Northville, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 5, 1976, Ser. No. 655,334
Int. Cl.[2] B66D *1/00*
U.S. Cl. 254—167 7 Claims



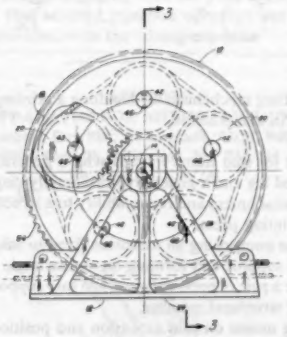
1. A hoist for lifting loads having an input drive and an output drive, the output drive being adapted to engage a chain attached to the load, the hoist having means to transmit force from the input drive to the output drive, the transmitting means comprising:
a splined shaft rotatably mounted within a housing and attached to the output drive;
a plate, having friction material on one face thereof, rigidly mounted on the splined shaft;
an annular member mounted on the splined shaft, having a gripping surface on the surface facing the plate and a spiral cam follower surface on the opposite face, the member being adapted for rotational and axial movement along the splined shaft;
a ratchet wheel having a plurality of teeth rotatably mounted on the shaft between the plate and a spiral cam member so that the gripping surface can engage the sides of the ratchet wheel, the ratchet wheel being adapted to transmit force from the input drive;
a pawl which allows rotation of the ratchet wheel in only one direction;
the spiral cam member mounted on the splined shaft is prevented from either angular or axial movement relative to the shaft and has associated therewith biasing means for biasing the spiral cam member into engagement with the spiral cam follower so that the sides of the ratchet wheel are firmly gripped by the friction material;
means for rotationally moving the spiral cam member relative to the cam follower to a disengaged position whereby the ratchet wheel is not contacted by the frictional material; and
a locking means suitable for holding the spiral cam member in a disengaged position to allow free chaining of the hoist, the locking means being sensitive to an acceleration of a first magnitude produced by a force acting at an angle to a surface of the locking means which will cause the locking means to disengage and the locking means being sensitive to an angular velocity of a second magnitude produced by a centrifugal force acting through the center of mass of the locking means which will cause the locking means to disengage; the disengagement of the locking means releases the biasing means which moves the spiral cam member into engagement with the annular member thereby applying a braking force to the output drive and stopping the free movement of the chain.

4,065,101

TORSION SPOOL

Mehmet D. Korkut, 3848 Veteran Blvd., Metairie, La. 70002

Filed Oct. 7, 1976, Ser. No. 730,502
Int. Cl.[2] B66D *1/26*
U.S. Cl. 254—184 9 Claims



1. An improved torsion spool for reeling spooling line in and out comprising:
a. a stand secured to supporting structure and extending substantially thereabove;
b. a stationary shaft supported by its ends on said stand;
c. a center gear fixed on said stationary shaft and adjacent and end thereof;

d. a composite drum having circular end plates center mounted on and around said stationary shaft for rotation therearound, said end plates being spaced apart by a plurality of transverse shafts mounted for rotation therein and therebetween without interference with each other, said transverse shafts being mounted intermediate the center and the perimeter of said circular end plates;

e. a plurality of satellite gears, similar to and meshing with said center gear, keyed respectively to said transverse shafts for rotation therewith as said drum end plates rotate around said stationary shaft;

f. a plurality of satellite cylinders fixed to said transverse shafts for rotation therewith, said cylinders having circumferential surfaces defining respectively similar helical grooves and adjustable with respective shafts and satellite gears to position for said grooves of adjacent cylinders to be in helical alignment; and

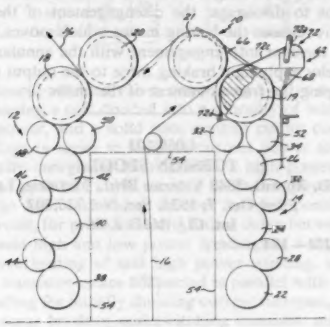
g. means to rotate said end plates.

4,065,102

METHOD OF REMOVING PRINTING PRESS ROLLERS AND REMOVAL MECHANISM FOR USE THEREIN

Laurence E. Johnson, 2063 S. Birch, Santa Ana, Calif. 92707, and Duane S. Reynolds, 1180 Bryan, No. D, Tustin, Calif. 92680

Filed Aug. 9, 1976, Ser. No. 712,912
Int. Cl.² B66D *1/00*
U.S. Cl. 254—186 HC **4 Claims**



1. A handling mechanism for handling a printing press roller comprising in combination,

a frame,

a support for said frame formed with a generally vertically disposed leg and a generally horizontally disposed leg for ready attachment and removability to a structural member of a printing press,

said frame comprising an extension fixed to said vertical leg of said support and forming an obtuse angle therewith to engage a pair of press rollers when said support is attached to said structural member,

mounting means on said extension and positioned between said extension and said support and comprising a generally horizontal mounting pad,

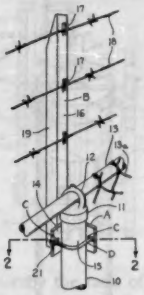
and a winch secured to said mounting pad and having a line which is directed generally horizontally toward said extension and thereby being coupled to a printing press roller for handling thereof and also provide the effect that a pulling force on said line exerts a force on said pair of press rollers.

4,065,103

FENCE ATTACHMENT

Charles R. Sweezey, Rte. 4, Box 40, Piedmont, S.C. 29673

Filed Mar. 29, 1976, Ser. No. 671,681
Int. Cl.² E04H *17/00*
U.S. Cl. 256—11 **2 Claims**



1. An attachment for use in stringing barbed wire and the like on existing chain link fences having vertical posts comprising:

a vertical angle having diverging legs for receiving and engaging a vertical post therebetween;

an upright member, extending above the fence, having a web and a lower end integrally connected to said vertical angle adjacent a junction of said legs;

barbed wire receiving and securing means carried on said web;

a horizontal channel adjacent a free edge of each of said diverging legs of said vertical angle;

an arcuate shank extending through each of said channels, said shank being disposed horizontally and defining a bight for receiving said vertical post therewithin;

a first abutment carried by said shank adjacent one end thereof abutting the exterior of one of said diverging legs adjacent one of said channels for retaining said shank in said channel;

a second abutment threadably carried upon said shank adjacent the remote end thereof for abutting the exterior of the other of said diverging legs adjacent said other channel for securing the attachment tightly upon said vertical post; and

said other channel being open at said free edge of its respective diverging leg for receiving said shank when pivoted in a generally horizontal movement about said first abutment.

4,065,104

SCHOOL CROSSING BARRICADE

Sidney M. Pass, 910 Pickens Ave., Pensacola, Fla. 32503

Filed Mar. 16, 1976, Ser. No. 667,376
Int. Cl.² A01K *3/00*
U.S. Cl. 256—13.1 **1 Claim**

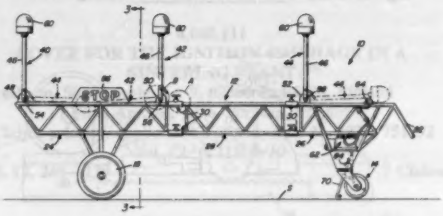
1. A portable barricade for use at school crossings, and the like, comprising, in combination:

a. a frame movable over a support surface;

b. a signal means mounted on the frame for warning parties approaching the barricade of the presence of certain hazardous conditions; and

c. brake means mounted on the frame for permitting selective retention of the barricade in a desired location, the brake means including a brake arm pivotally mounted on the frame for moving between a disengaged position and a position engaging the support surface which supports the frame for restraining the frame from movement relative to the support surface, the frame including wheels rotatably mounted thereon for facilitating movement of the frame,

the frame having a pair of longitudinally spaced ends, and wherein the wheels include a caster disposed adjacent an end of the frame, with the brake arm being pivotally mounted on the frame adjacent the caster and of a length sufficient to lift the caster from the support surface which supports the frame when the brake arm is in the position engaging the support surface, the brake means further including an actuating lever cantilever mounted on the brake arm and arranged extending away from the frame for facilitating movement of the brake arm from the disengaged position to the position engaging the support surface by the application of foot pressure to the lever, and a tension spring connected to and extending between the actuating lever and the frame for biasing the brake arm toward its disengaged position, the wheels further including a pair of axially spaced, fixed wheels disposed on the frame at the end thereof spaced from the caster, the frame further including a plurality of sections selectively connectible to one another in predetermined numbers to vary the length of the frame, the signal means including a lamp assembly and a power supply connected to the lamp assembly, the lamp assembly including a pole pivotally mounted on the frame for swinging movement between an operative position extending away from the frame and a storage position substantially adjacent the frame, there being a plurality of lamp assemblies each pivotally mounted on the frame, each of the lamp assemblies including a flashing lamp, and the power supply being a rechargeable battery pack mounted on the frame and including an electrical switch for selectively energizing the flashing lamps.

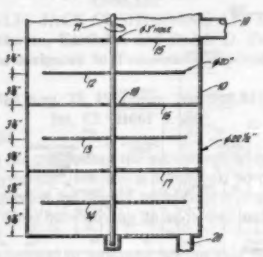


4,065,105

FLUIDIZING MEANS FOR REDUCING VISCOSITY OF SLURRIES

Guy W. Lussiez, Golden, Colo., and Hugh F. Reid, Union City, Calif., assignors to Amax Inc., Greenwich, Conn.

Filed Sept. 17, 1976, Ser. No. 724,364
Int. Cl.² B01F 7/16, 9/00
U.S. Cl. 366—348 **11 Claims**



1. A process of reducing the viscosity of a work hardened slurry of finely divided ore having a pulp density of at least about 15% by weight of solids which comprises,

gently mechanically agitating a mass of said work hardened slurry confined in a container whereby to cause relative movement between said mass and a contacting surface such that said mass is subjected to shear forces,

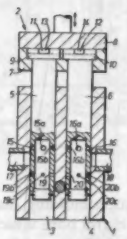
the relative movement with respect to said contacting surface being at a selected linear velocity sufficient to provide shear forces in said agitated mass in contact therewith effective for reducing the viscosity to a desired level more than 50% below the original viscosity, and continuing said agitation at substantially said selected linear velocity until the viscosity has been reduced to said desired level.

4,065,106

MIXING HEAD FOR MACHINES FOR PRODUCING MULTICOMPONENT PLASTICS

Ferdinand Althausen, Neunkirchen, and Reiner Raffel, Siegburg, both of Germany, assignors to Maschinen Fabrik Hennecke GmbH, Leverkusen, Germany

Filed May 8, 1975, Ser. No. 575,848
Claims priority, application Germany, May 15, 1974, 2423492
Int. Cl.² B01F 15/00
U.S. Cl. 366—76 **7 Claims**



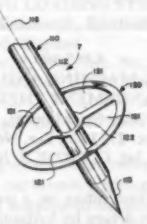
1. A mixing head for a machine for producing multicomponent plastics, comprising a housing, and at least two hollow slides which are guided in bores in the housing, said slides being coupled together by a yoke and having inlet openings which communicate with feedlines and injection openings which, in the mixing position of the slides, open into a mixing chamber, wherein the lift slides have a plurality of injection openings differing in cross-sectional area from one another, arranged in a single plane perpendicular to the axis of the slides and wherein the slides are provided with heads which carry changeover detents engaging with the yoke the detents being so arranged that selected injection openings can be brought into communication with the mixing chamber.

4,065,107

APPARATUS FOR MIXING LIQUIDS

Judd Van Horbek, Box 884, El Granada, Calif. 94018

Filed Oct. 29, 1976, Ser. No. 736,711
Int. Cl.² B01F 7/16
U.S. Cl. 366—343 **7 Claims**



1. An apparatus for mixing liquids, comprising:

a handle having an upper and a lower portion, said lower portion terminating in a salient surface; and

one or more slotted mixing blades attached to the lower portion of the handle;

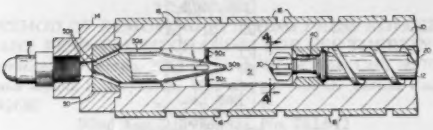
wherein said one or more slotted mixing blades are first, second and third blades, said first slotted mixing blade forms an outer circular ring and is planar with its plane perpendicular to said handle and its center concentric with the center of the handle, and said second and third slotted mixing blades are rectangular and planar, and perpendicular and parallel to the handle, and the second and third blades bisect the handle and the handle bisects the second and third blades, and the first blade forms an outer circular ring.

4,065,108

NON-RETURN VALVE FOR MOTTLE CHARGE IN PLASTIC INJECTION MOLDING MACHINE

Bernie A. Olmsted, East Longmeadow, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed Nov. 11, 1976, Ser. No. 740,933
Int. Cl.² B29B *1/06*
U.S. Cl. 366—76 **2 Claims**



1. In a plastic injection molding machine having a heated barrel, a screw in the barrel bore which is rotated to advance thermoplastic material, including pellets, toward a nozzle and thus to build up a charge of such material under pressure between the nozzle and front end of the screw, the screw being adapted to slide rearwardly in the bore from the pressure of such charge and being further adapted to be thrust forwardly and thus force the collected charge through the nozzle; an improved non-return valve comprising a stud on the front end of the screw having a forwardly extending reduced diameter portion and a larger diameter cylindrical rear portion and also having an enlarged diameter nose secured to its front end, flow passage means for the thermoplastic material and defined at least in part by said nose, and an annular valve shuttle engaging the wall of the barrel bore but slidable therein, the inside diameter of the shuttle providing a close sliding fit over the corresponding diameter cylindrical rear portion on the stud, said shuttle defining said flow passage means with said nose and providing space around the reduced diameter portion of the stud, and the shuttle being located with respect to the screw and stud so that during screw rotation the shuttle is forced forwardly by the advancing material into engagement with the stud nose in the open position for the valve and so that the screw is thrust forwardly the corresponding diameter rear porton of the stud slides into the inside diameter of the shuttle to close the valve against flow of the material rearwardly of the advancing screw.

4,065,109

TORCH CUTTING MACHINE AND DRIVE CONTROL ARRANGEMENT THEREFOR

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

Filed Dec. 27, 1976, Ser. No. 754,361
Int. Cl.² B23K *7/10*
U.S. Cl. 266—69 **12 Claims**

1. In a wheeled frame riding on a trackway and having at least one of its wheels driven by hydraulic motor means, and a hydraulic system for actuating said motor means including a hydraulic liquid flow orienting means for controlling the flow of hydraulic liquid to and from the motor means,

a drive control arrangement for controlling the operation of said flow orienting means and comprising:

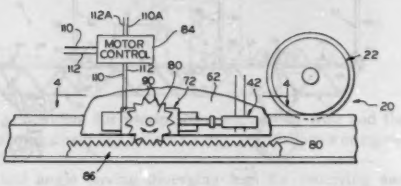
a stepping motor assembly mounted on said frame for free floating shifting rectilinear movement longitudinally of the trackway and including a stepping motor,

a rack extending longitudinally of the trackway and made stationary with respect thereto,

a gear driven by said motor and carried by said motor assembly,

said gear being in meshing relation with said rack for rolling movement along said rack when said stepping motor is driven to drive said gear,

said flow orienting means comprising a flow orienting valve including a housing made fast to said frame, a flow orienting valve member mounted in said housing and movable



between null and hydraulic motor driving positions, and means for biasing said valve member to its said null position,

with said valve member being connected to said stepping motor assembly for movement thereby when said stepping motor assembly is moved relative to said frame under the action of said gear rolling on said rack when said gear is driven by said motor,

and means for driving said stepping motor,

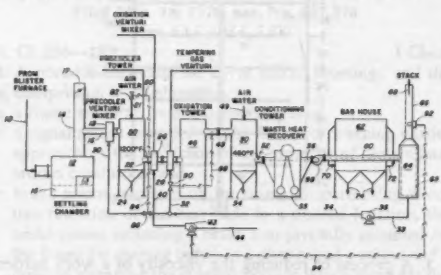
whereby when said stepping motor is at rest, said valve member is in its null position precluding driving of said hydraulic motor means, and when said stepping motor is driven said valve member is moved to a hydraulic motor driven position for driving said frame along the trackway through said hydraulic motor means to the exclusion of said stepping motor.

4,065,110

METHOD AND APPARATUS FOR PURIFYING BLISTER FURNACE EFFLUENT

Ralph A. Koenig, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Division of Ser. No. 587,957, June 18, 1975, Pat. No. 4,009,240.
This application Dec. 10, 1976, Ser. No. 749,236
Int. Cl.² B01D *53/34*
U.S. Cl. 266—78 **7 Claims**



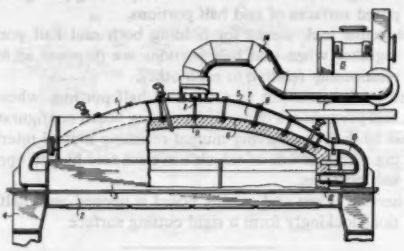
1. Apparatus for processing the effluent gases from a copper blister furnace during the charge and melt cycle and poling cycle comprising:

a. settling chamber means for receiving said effluent, and lowering the velocity of said effluent gases;
b. means for precooling said effluent gases with air and water;
c. air mixing means for oxidizing the oxidizable material in said effluent gases.
d. means for cooling said oxidized gases;
e. means for venting said cooled oxidized gases; and
f. means selectively operable during said poling cycle to recycle cooled gases from said venting means to the input to said precooling means;
g. means selectively operable during said poling cycle to inject air into the output gases from said precooling means; and
h. means selectively operable during said poling cycle to close the supply of air and water to said precooling means.

4,065,111
COVER FOR THE IGNITION CARRIAGE IN A SINTERING PLANT

Eero Kyto, Soukankuja 2 A 9, 02360 Espoo 36, Finland

Filed Apr. 21, 1976, Ser. No. 678,859
Claims priority, application Finland, Apr. 22, 1975, 751192
Int. Cl.² C21B *1/10*
U.S. Cl. 266—138 **7 Claims**



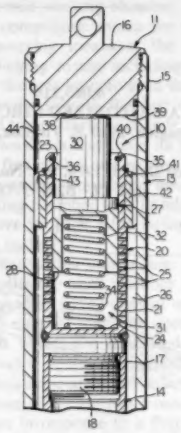
1. In a cover for the ignition frame of a sintering apparatus wherein said cover includes sides, burners mounted substantially horizontally on the sides of the cover and means for supplying combustion air to said burners, the improvement comprising said combustion air supplying means including a blower and an intermediate, enclosed space arranged in said cover, a pipe connecting said blower to a central portion of said cover for communicating said blower with said space and insulated pipes connected to said burners and to said space adjacent the sides of said cover for communicating said space with said burners whereby combustion air is conducted from said blower via said space to the burners.

4,065,112
HYDRAULIC JACK CUSHIONING APPARATUS

Edward V. Leskovec, Eastlake, and Ralph D. Porter, Euclid, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Aug. 23, 1976, Ser. No. 716,847
Int. Cl.² B66F *3/24*
U.S. Cl. 267—34 **9 Claims**

1. Apparatus for cushioning the movement of one telescopic member of a hydraulic jack toward another, comprising:
wall means carried by one of said telescopic members and forming a blind bore having an open end and an opposite closed end;
a plunger reciprocably mounted within said blind bore for movement between a first position adjacent the open end of the bore and a second position adjacent its closed end and defining a variable chamber therebetween;
surface means carried on the other of said telescopic members for engagement with said plunger to effect the displacement of the plunger toward its second position as the telescopic members approach a predetermined position relative to each other;
a plurality of axially spaced orifices formed through said wall means between said first and second positions of the plunger so as to be sequentially closed off by the plunger as it moves towards its second position, thereby progressively restricting the escape of fluid from the chamber as the plunger approaches its second position;
biasing means for normally biasing said plunger toward its first position;
said plunger has an inner end having a spring cavity formed therein, and said biasing means includes a helical compression spring having one end seated within said spring cavity and its other end seated against the closed end of the blind bore;



a snap ring disposed within a groove formed adjacent the open end of the bore for retaining the plunger therewithin;
said other member has an end cap closing one end thereof, said end cap having an inner transverse surface thereon providing said surface means;
said other member has an end portion adjacent said end cap and said wall means is mounted to said end portion with the open end of said bore facing said end cap of the outer member; and
said plunger has an elongated stem extending therefrom, said stem having a distal end extendable from the open end of the bore for engagement with the transverse surface of the end cap.

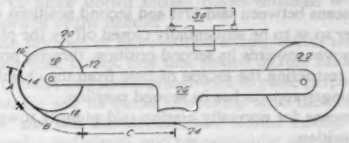
4,065,113
SPRING LOADING SYSTEMS

David Allan Wright, Edinburgh, Scotland, assignor to Ferranti Limited, Hollinwood, England

Filed Apr. 5, 1976, Ser. No. 673,541
Claims priority, application United Kingdom, Apr. 11, 1975, 15032/75
Int. Cl.² F16F *1/04*
U.S. Cl. 267—156 **12 Claims**

1. A spring loading system comprising a former surface of substantially constant curvature, a spring strip of substantially uniform cross section adapted to be wound from a naturally unstressed state to conform closely with the surface of the former in a stressed state, coupling means connectd to a driven member to couple movements of the member with winding or

unwinding of the strip, and means for ensuring that the strip conforms substantially to a predetermined shape for a prescribed distance away from its point of contact with the former surface, or with itself if spiral wound.

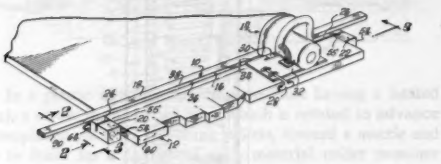


4,065,114

GUIDE FOR A MOTORIZED CIRCULAR HANDSAW

Charles A. Pennington, 2910 E. Virginia, No. 17, West Covina, Calif. 91790

Filed Dec. 3, 1976, Ser. No. 747,368
Int. Cl.[2] B25B *3/00*
U.S. Cl. 269—2 **9 Claims**



1. Guide means for guiding a saw along a workpiece, the saw having a slide plate with an edge surface thereon which is parallel to the saw line of the saw, said guide means including:

a guide member having a workpiece engaging surface and at least one guiding abutment surface against which the edge surface of the saw slide plate can slide and be guided, said guide member being shaped to define a longitudinal channel therewithin,

a pair of clamp members for retaining said guide member in the desired guiding position on the workpiece, said members each having an end portion adapted to slidingly engage said guide member channel and to be retained thereby, a resilient member adapted to frictionally and forcibly engage the workpiece on the opposite side thereof from said guide member workpiece engaging surface, and means forming a connection between said end portion and said resilient member of said clamp member, said means forming a connection between said end portion and said resilient member including a body portion, said end portion forming one end thereof, a lever arm including means to retain said resilient member thereon, pivot means connecting said body portion and said lever arm, and means to retain said lever arm in desired positions with respect to any body portion, said means to retain said lever arm in desired positions with respect to said body portion including a lock lever having first frictional means thereon,

lock lever pivot means which pivotally restrain said lock lever to said body portion, and

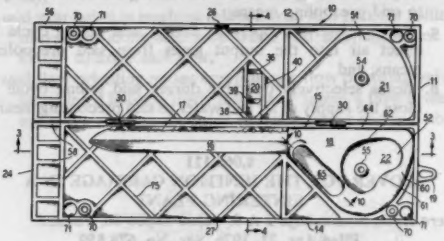
second frictional means on said lever arm in position to be selectively engaged with said first frictional means to enable said lock lever to jam said lever arm in position with its resilient member engaged with the workpiece.

4,065,115

FOLDABLE CUTTING BOARD

Samuel J. Popeil, and Lorenzo Anthony Ruiz, both of Chicago, Ill., assignors to Popeil Brothers, Inc., Chicago, Ill.

Division of Ser. No. 683,479, May 5, 1976, Pat. No. 4,015,330.
This application Dec. 13, 1976, Ser. No. 749,606
Int. Cl.[2] A47J *47/00*
U.S. Cl. 269—16 **19 Claims**



1. A cutting board comprising:

hinged opposed half portions,

a cutting surface formed on correspondingly aligned opposed surfaces of said half portions,

releasable lock means for holding both said half portions together when said half portions are disposed in folded relationship relative to each other,

and latch means for securing said half portions when said half portions are opened in a cutting board configurations,

said latch means having mutual releasing mutual interlocking members one of which traverses said hinged opposed half portions,

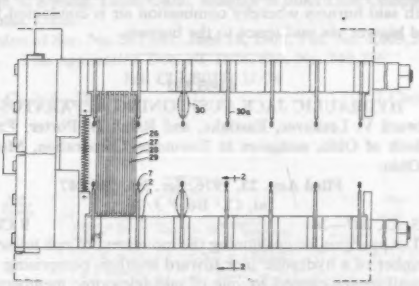
whereby, when said cutting board is opened, said half portions lockingly form a rigid cutting surface.

4,065,116

CLAMPING OF BATTERY PLATE BLOCK ASSEMBLIES

Hans-Georg Lindenberg, Hannover; Joachim Illmann, Stelingen, and Hans-Joachim Golz, Hannover, all of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Sept. 22, 1976, Ser. No. 725,638
Claims priority, application Germany, Dec. 2, 1975, 2554069
Int. Cl. A61g *13/00*
U.S. Cl. 269—22 **11 Claims**



1. Apparatus for clamping together the plate blocks of lead storage batteries, comprising:

at least one clamping element positioned adjacent an outer surface of the block,

the element having generally planar face engaging the block surface,

the element being constructed so that the planar face is pneumatically deformable so as to bulge toward the adja-

cent block surface, thereby to apply a controllable clamping force to said surface,

the element having a multi-layer construction, including innermost layers formed of an elastic membrane, and resilient plates adjacent portions of the outer surfaces of the membrane, and means for introducing gas under pressure between the innermost layers,

the elastic membrane being responsive to the gas pressure to expand, thereby pressing outwardly against the resilient plates and causing them to bulge and provide the clamping force, and

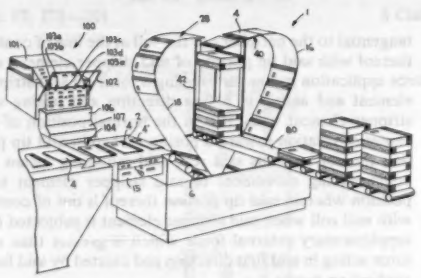
the element having bulkheads positioned between the membrane and the plates, the bulkheads having cut-outs through which the membrane can bear against the plates.

4,065,117

METHOD AND AN APPARATUS FOR ADDRESSING AND STACKING INDIVIDUAL PIECES OF PRINTED MATTER FOR MAILING, ESPECIALLY MAGAZINE COPIES, BOOKLETS AND OTHER BINDERY ARTICLES

Ivar Thorsheim, Kalkfjellet 15, 1370 Asker, Norway

Filed May 25, 1976, Ser. No. 689,844
Int. Cl.² B65H *39/02*
U.S. Cl. 270—58 **15 Claims**



1. A method for addressing and stacking individual pieces of printed matter for mailing, such as sheets of paper, magazine copies, booklets and other bindery articles wherein each mailing piece has a back, comprising the steps of:

a. applying individual address identification data to each mailing piece from computer-processed recording means, the application of the individual address data being accomplished by means of data record-forming means;

b. conveying such labelled mailing pieces one by one to at least one stacking machine, said pieces entering said stacking machine with the address label and the back of each mailing piece oriented in the same way, said stacking machine including a stacking chamber for receiving said articles, first and second conveying means each having an inlet and an outlet, said first and second outlets each associated with a respective opposite side of said stacking chamber, and a shift member adapted for diverting predetermined numbers of pieces to either said inlet of said first conveying means or said inlet of said second conveying means;

c. operating said shift member, the operation of said shift member being in response to a first set of symbol combinations stored at appropriate locations in said computer-processed recording means so as to stack the mailing pieces in batches comprising a selected number of pieces, the backs and the address labels of the pieces of each batch being oriented the same way, but oppositely of the backs of the pieces in an underlying batch, based on the said conveying means on which the pieces are conveyed;

d. operating a selector means for initiating removal of a full pile composed of a plurality of batches of such oriented mailing pieces, the operation of said selector means being in response to a second set of symbol combinations stored at appropriate locations in said computer-processed recording means.

10. Apparatus for stacking individual pieces of printed matter for mailing, such as sheets of paper, magazine copies, booklets and other bindery articles wherein each mailing piece has a back edge, said articles entering the stacking machine one by one oriented the same way and having an address label attached thereto at approximately the same location on each article, said apparatus comprising

a stacking chamber for receiving said articles,

first and second conveying means each having an inlet and an outlet, said first and second outlets each associated with a respective opposite side of said stacking chamber,

a shift member adapted for diverting predetermined number of articles to either said inlet of said first conveying means or said inlet of said second conveying means,

and a selector means for initiating removal of a pile of articles collected in said stacking chamber,

the improvement comprising: means for driving said first and second conveying means at the same conveying speed, said conveying means including uninverted conveying parts for the articles conveyed there along, so that each article conveyed along the first conveying means will be delivered to the stacking chamber with its address label turned downwards and have its back edge facing away from said first outlet, and so that each article conveyed along the second conveying means will be delivered to the stacking chamber with its address label turned upwards and have its back edge facing away from the second opposite outlet,

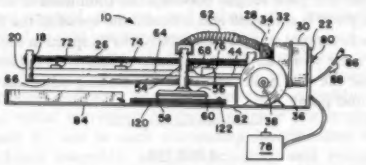
and the improvement further comprising: a detector means and a control unit, the shift member and the selector means being connected to the control unit for the operation of said shift member and said selector means in response to signals which are generated by the detector means, said detector means being positioned to detect pertinent code data associated with a data bank containing all the address data of the address labels, so as to operate said shift member in response to a first set of code data combinations for thereby stacking articles in batches comprising a selected number of articles all oriented the same way, and so as to operate said selector means in response to a second set of code data combinations for thereby removing a pile composed of a plurality of batches.

4,065,118

MONO-PAGE PAPER DISTRIBUTOR

George M. Dudley, 69 N. Boxwood St., Hampton, Va. 23365

Filed Nov. 29, 1972, Ser. No. 310,617
Int. Cl.² B65H *3/08, 5/10*
U.S. Cl. 271—14 **6 Claims**



1. An improved device for removing the top sheet from a stack of sheets and transporting said top sheet to a predetermined location comprising:

a stack of sheets including a top sheet;

means for displacing said top sheet thereby separating said top sheet from said stack of sheets;

means for thereafter creating a vacuum, said vacuum means having suction head means associated with said sheet displacing means such that when said top sheet is in the displaced condition said suction means picks up and moves said top sheet from said stack of sheets;

means for transporting said sheet displacing means from said stack of sheets to a predetermined location and back to said stack of sheets; said means for transporting said sheet-displacing means toward and away from said stack of sheets being a rotating threaded shaft on which said sheet-displacing means is threadably mounted;

means for simultaneously controlling the operation of said vacuum means and said transporting means such that when said sheet-displacing means is at said stack of sheets said vacuum means operates and when said sheet displacing means is at said predetermined location, said vacuum means does not operate; and prime mover means for energizing said above-mentioned means.

4,065,119

PROCESS AND APPARATUS FOR TRANSPORT OF ORIGINALS IN A REPRODUCTION APPARATUS

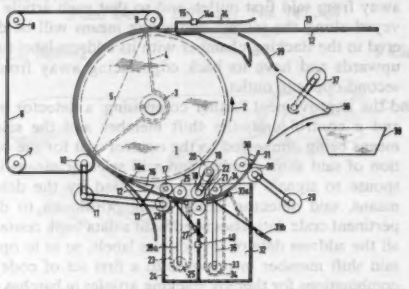
Herbert Schröter, Taunusstein, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Oct. 18, 1976, Ser. No. 732,980

Claims priority, application Germany, Oct. 16, 1975, 2546438

Int. Cl.² B65H *29/64*

U.S. Cl. 271—172 **19 Claims**



1. A process for the transport through a copier of an original having a leading and a trailing edge, which comprises transporting the original at least once along a path wherein it passes in the stated order a third point, an illumination zone, a fourth point, a first point, a second point and, if transported more than once, the third point, the illumination zone, the fourth point, the first point and the second point again, wherein if the trailing edge has not passed the third point when the leading edge passes the second point the path length between the first and second points is extended and wherein if the trailing edge has not passed the second point when the leading edge passes the first point the path length between the illumination zone and the first point is extended and wherein the speed of the original past the first point is increased relative to its speed in the illumination zone while an extended path is followed between the zone and the first point and after the trailing edge has passed the second point.

4,065,120

COPY PAPER STRIPPING MEANS

Masaru Imaizumi, Shinshiro, and Syotaro Inagaki, Okazaki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 4, 1976, Ser. No. 729,642

Claims priority, application Japan, Oct. 17, 1975, 50-142045; Nov. 5, 1975, 50-151025

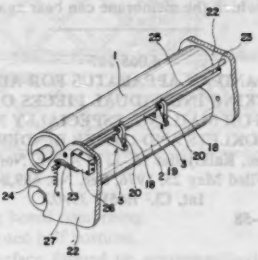
Int. Cl.² B65H *29/54*

U.S. Cl. 271—174 **14 Claims**

1. In a photocopying machine wherein a sheet of copy paper carrying toner particles defining the image of an original document is passed between a heating roll and a press roll constituting a fuser assembly, whereby said toner particles are fused and fixed in position, copy paper stripping means comprising:

at least one stripper element having a tip portion for contacting the peripheral surface of one of said rolls for effecting detachment of copy paper from said roll;

mounting means for freely rotatably mounting said stripper element about a center of rotation thereof for rotational movement relative to said roll and for movement of said center of rotation in a direction at least partly toward and away from the roll means, and normally positioning the center of rotation of said stripper element in an area intermediate the periphery of said roll and a plane which is



tangential to the periphery of the roll at the line of contact thereof with said tip portion of said stripper element; and

force application means for exerting a force on said stripper element and acting in a first direction and urging said stripper element when it is in the normal position of the center of rotation toward a position wherein said tip portion thereof contacts said roll, said mounting means accommodating movement of said stripper element to a position wherein said tip portion thereof is out of contact with said roll when said stripper element is subjected to a supplementary external force which is greater than said force acting in said first direction and exerted by said force application means.

4,065,121

SHEET DETACHING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

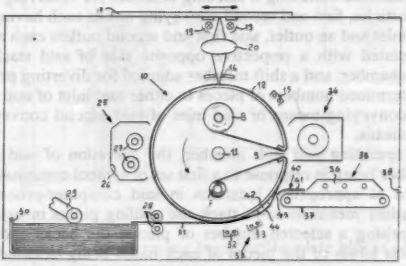
Giorgio Siletto; Piero Bena, both of Turin, and Bruno Cestari, Collegno (Turin), all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Nov. 3, 1976, Ser. No. 738,197

Claims priority, application Italy, Nov. 10, 1976, 69760/76

Int. Cl.² B65H *29/56*

U.S. Cl. 271—174 **5 Claims**



1. Device for detaching a copy sheet held by electrostatic attraction to the photoconductive element carried by the drum of an electrophotographic copying machine comprising:

means defining a radial protuberance in the periphery of the drum between its surface and said element in the zone in

which the leading edge of the copy sheet contacts the element,

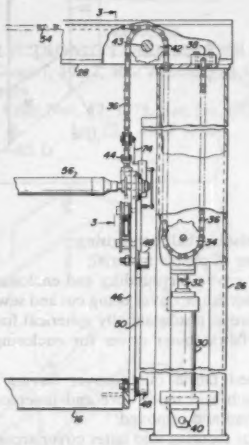
a pick off finger fixedly mounted adjacent the drum at such a distance as to engage said element only in correspondence with said protuberance, whereby during the rotation of the drum the pick off finger engages the leading edge of the copy sheet and detaches it from the element.

4,065,122

EMERGENCY BRAKE FOR MOVABLE CONVEYOR

Jamshid Rejai, Lindenwold, N.J., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed July 14, 1976, Ser. No. 705,191
Int. Cl.[2] B65H *29/50*
U.S. Cl. 271—201 **4 Claims**



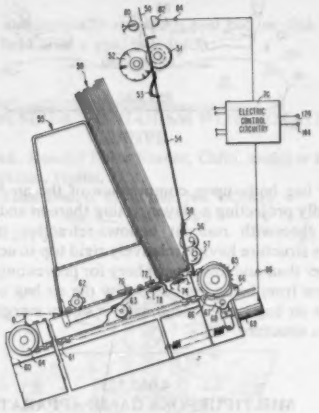
2. Sheet stacking apparatus comprising a stacking conveyor adapted to receive sheets and discharge the same from one end thereof sequentially to form a vertical stack, a standard adjacent the discharge end of said conveyor, the discharge end of said conveyor being coupled to a first end of a chain, a second end of said chain being attached to said standard, said chain being received about first and second rotatable sprockets, said second sprocket being rotatable about a fixed axis and said first sprocket being movable in a vertical direction, power means for lowering said first sprocket and for thereby raising the discharge end of said conveyor in synchronism with increase in the height of the stack, a vertical guide for the discharge end of the conveyor as it is moved vertically, braking means adjacent the discharge end of the conveyor for potential engagement with said guide to arrest accidental descent of the discharge end of said conveyor, restraining means for preventing engagement of said braking means with said guide while said chain is under tension, said restraining means being coupled between said braking means and said chain, and biasing means for urging said braking means toward engagement with said guide when said restraining means is ineffective.

4,065,123

APPARATUS FOR STACKING DOCUMENTS IN SEQUENCE

Fred Victor Arrasmith, San Jose; Donald George Bruns, Saratoga; John Stuart Moffitt, San Jose, and Stanton Kline Moss, Gilroy, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1976, Ser. No. 746,760
Int. Cl.[2] B65H *31/06*
U.S. Cl. 271—215 **20 Claims**



1. Apparatus for stacking documents in sequence, comprising

a bed assembly on which said documents are to be stacked,

a backstop assembly slidably arranged on said bed assembly,

a backplate assembly arranged at one side of said backstop assembly,

electric circuit components on said bed assembly and on said backstop assembly arranged at a spacing proportional to a predetermined initial increment of stacking space located between said backplate and said backstop assemblies,

a sensing assembly for detecting the entrance of a document into the space between said backstop and backplate assemblies,

an escapement assembly arranged on said bed assembly and coupled to said backstop assembly for alternatively fixing and freeing said backstop assembly with respect to said bed assembly and having an electric control element for actuating said escapement assembly,

an electric control signal generating circuit arrangement having input terminals connected to said electric circuit components, output terminals connected to said escapement control element, and other input terminals connected to said sensing assembly, and

circuitry intermediate said terminals for counting a series of said documents entering the stacking space between said backstop assembly and said backplate assembly within said initial increment of stacking space, for storing said count for use in each succeeding incrementing of said backstop assembly, and for actuating said escapement assembly for subsequent incrementing of said backstop assembly along said bed assembly.

4,065,124

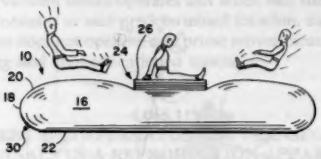
HIGH-BOUNCE AMUSEMENT AND EXERCISE AIR BAG

Michael F. Egan, 16 Rose St., Timonium, Md. 21204

Filed July 29, 1976, Ser. No. 709,604
Int. Cl.[2] A63B *5/00*
U.S. Cl. 272—65 **2 Claims**

1. In an amusement and exercise air bag for one or more players, the improvement comprising: a rounded air bag body

having generally planar upper and lower surfaces; bellows structure, the bellows structure having pneumatic connection with the air bag body at the upper central portion of the air bag body, comprising the bellows structure being generally inverted-cup-shaped with the lower periphery having sealing connection at an opening in the air bag body for unrestricted passage of air between the bellows structure and the air bag body; the bellows structure being upwardly distendable from



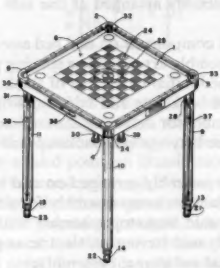
the air bag body upon compression of the air bag body for upwardly projecting a player resting thereon and having associated therewith resilient bellows-retractive structure, the bellows structure having relatively rigid top structure larger in diameter than said lower periphery for preventing the rigid top structure from being pressed below the air bag upper surface, and the air bag body extending as a safety margin around the bellows structure.

4,065,125

MULTIPURPOSE GAME APPARATUS

Peter Chan, Toronto, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 29, 1977, Ser. No. 792,329
Int. Cl.[2] A63D *15/04*
U.S. Cl. 273—5 R **1 Claim**



1. Multipurpose game apparatus for billiards, snooker, checkers and chess, said game apparatus comprising

a table having a table top of substantially square shape with four corners, an oversurface and an undersurface, and a plurality of support legs each threadedly coupled to the table top at the undersurface thereof with each support leg at a corresponding one of the corners, each of the support legs having a support member universally mounted thereon for length adjustment and positioning at the bottom thereof, the upper surface of the table top having a checker board marked thereon and a fouls circle at the center thereof;

a plurality of short legs a fraction of the length of the support legs each threadedly coupled to the table top at the undersurface thereof in the area of a corresponding corner for supporting the table top a short distance above a supporting surface when the support legs are removed;

a plurality of pockets formed in the oversurface of the table top each at a corresponding corner thereof;

a drawer slidably mounted on the undersurface of the table top;

a plurality of cue sticks;

clamp means on each of the support legs for releasably supporting the cue sticks on the legs; and

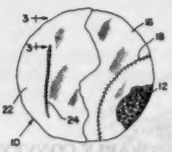
a plurality of chess disks and checkers removably stored in the drawer.

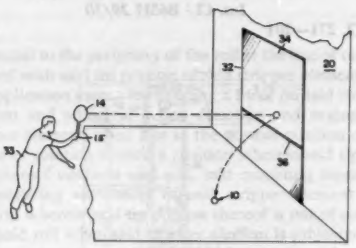
4,065,126

PRACTICE TENNIS BALL AND APPARATUS

David Mantz, 7950 Henry Ave., Philadelphia, Pa. 19128

Filed June 30, 1975, Ser. No. 591,858
Int. Cl.[2] A63B *37/12*
U.S. Cl. 273—58 A **3 Claims**





1. A practice playing ball comprising:

a soft inner core of pliable material;

an inner fabric cover surrounding and enclosing said inner core, said inner fabric cover being cut and sewn to enclose said inner core in a substantially spherical form;

a soft knitted fabric outer cover for enclosing said inner cover;

said soft knitted fabric outer cover having an opening through which said inner core and inner cover can be readily inserted and removed;

elastic means for securing said outer cover around said inner cover; and

powdered chalk impregnated in said knitted fabric outer cover. for indicating a contact point of said ball on a surface rebounded thereagainst.

4,065,127

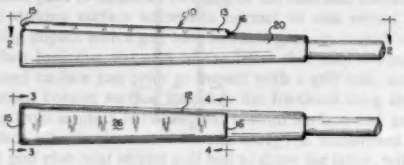
GOLF CLUB GRIP ATTACHMENT

William J. Fagan, 715 Karen Lane, San Antonio, Tex. 78218

Filed July 2, 1976, Ser. No. 702,283
Int. Cl.[2] A63B *53/14*
U.S. Cl. 273—81 D **1 Claim**

1. In combination a golf club having a hand grip portion on the upper end of the shaft of the club and a head portion on its opposite end and a non-wrapped, exposed grip attachment secured thereto, said grip attachment comprising an elongate body attached to the surface of the grip portion and extending longitudinally therealong, said body being in the form of an isosceles trapezoid in plan and symmetrical on its opposite longitudinally extending sides and having a flat front surface extending along the length of body said, alignment means formed on said body to accommodate the placement of both hands of the player thereon comprising side walls formed on

the longitudinally extending sides of said body, rounded corner portions connecting between the adjoining edges of said side walls and said flat front surface, a bottom end wall defining the lowermost transverse edge of said body and which is spaced upwardly on said grip portion from the lower end thereof, said flat front surface of said body being disposed at an angle of approximately 95° with respect to the leading edge of the head of the club, whereby said alignment means is gripped by both



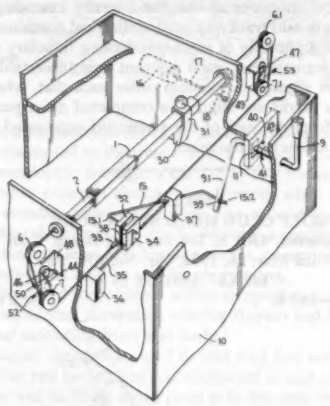
hands of the player such that the side walls and corner portions of the body are oriented in preselected position with respect to the fingers of the player's hand and the thumb of the lower hand is disposed over the bottom wall of said body in predetermined position thereon, said grip being thus effective to regulate the orbit of swing of the hands of the player as he swings the golf club and the consequent direction of flight and distance traveled by the golf ball upon being struck by the golf club.

4,065,128

ELECTRONIC TABLE SOCCER GAME

Alexandre Gomori, 10-12, Rue Arnold Van Gennep, Bourg-la-Reine, France

Filed Nov. 17, 1975, Ser. No. 632,831
Int. Cl.² A63F *7/06*
U.S. Cl. 273—85 D **7 Claims**



1. In a table game, such as soccer, hockey or the like, including a playing field with goals at either end, across which are arranged a plurality of rows of controllable figurines for maneuvering a ball or disk across said playing field and into an opponent's goal, said game further including means for slidably mounting said rows of figurines on a mounting support bridging side walls of the playing field such that the transverse location of said figurines is mechanically adjustable through control handles operable by players of the game at opposite ends of the playing field, said rows of figurines each further adapted such that, through rotation of the mounting support in response to the operation of a solenoid, the figurines are rotated about a horizontal axis with the lower portion of one of said figurines contacting said ball or disk and propelling said ball or disk in longitudinal directions along said playing field, said solenoid being operable in response to a player closing a switch on the control handle and biased such that after said rotation, the solenoid and figurines return to a vertical orientation, said improvement in said game comprising:

means for transforming circular movements of each of said control handles into rectilinear movements and for applying said rectilinear movements to a row of figurines;

restrictor means for limiting rotational movement of said control handles;

photoelectric control means for counting the number of times said ball or disk is propelled into an opponent's goal; and

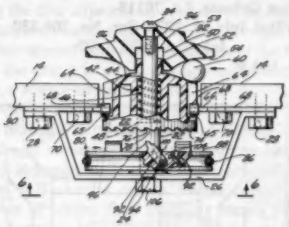
means for automatically returning said ball or disk to said playing field after a goal is scored.

4,065,129

PIN BALL BUMPER MECHANISM WITH ROTATIONAL DRIVE

Stephen Bartok, Rancho Palos Verdes, Calif., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,831
Int. Cl.² A63F *7/10*
U.S. Cl. 273—121 A **25 Claims**



10. A bumper mechanism adapted to be mounted in a pin ball machine having a play surface along which pin balls can be projected, said bumper mechanism comprising first and second bumper elements defining a slot therebetween, means for mounting one of said bumper elements for sliding movement between a first normal position adjacent the other of said bumpers and a second position remote from the other of said bumpers in response to the entrance of a pin ball into said slot; a drive element adapted to be rotatably mounted in said pin ball machine adjacent said bumper elements, and means for rotating said drive element; said one of said bumper elements and said drive element including cooperating means engaging each other in the second position of said one bumper element for driving said one bumper element from its second towards its first position in response to rotation of said drive element, thereby to squeeze a pin ball in said slot and project it from the bumper.

4,065,130

BOARD GAME WITH TIME INDICATOR MEANS

Vincent M. Geraci, 1550 N. Lake Shore Drive, Apt. 3G, Chicago, Ill. 60610

Filed Feb. 23, 1976, Ser. No. 660,050
Int. Cl.² A63F *3/00*
U.S. Cl. 273—130 AB **5 Claims**

1. Apparatus for a game of logic and strategy, said apparatus comprising:

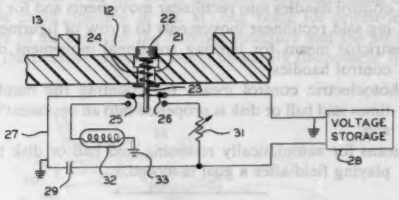
board means characterized by a plurality of regularly-arrayed playing piece site means;

a plurality of playing piece means adapted to selectively occupy said playing piece site means; and

elapsed time indicator means,

said indicator means activated by placement of one of said playing piece means at a selected one of said playing piece site means,

said indicator means thereby signalling occupation of said selected site means,



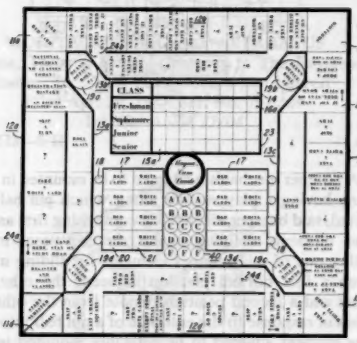
said signalling persisting for a predetermined length of time before ceasing.

4,065,131

BOARD GAME APPARATUS

Richard Thomas Martin, Jr., 10202 Club Creek Drive, No. 308, Houston, Tex. 77036, and David Michael Engert, 2834 Ursulines St., New Orleans, La. 70119

Filed July 12, 1976, Ser. No. 704,230
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—134 B **15 Claims**



1. A game board apparatus for a plurality of players comprising:

a. a board having first and second alternate paths of travel indicated thereon, wherein:

i. each of said paths consists of a series of spaces representing movement steps,

ii. said first path includes a greater number of spaces than said second path,

iii. a plurality of the spaces of said first path are coincident with a respective plurality of spaces of said second path, and

iv. a plurality of the spaces of said first and second paths are action spaces, each directing that an action be taken by a player landing thereon;

b. action indicator means for specifying a plurality of pairs of actions to be taken by a player in response to landing on one of said action spaces, wherein:

i. the first action of each pair is associated with said first path and the second action of each pair is associated with said second path, and

ii. the first actions are statistically of greater relative benefit and less relative consequence than the second actions; and

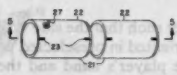
c. selection means for indicating which of said plurality of pairs of actions are to be followed when a player lands on one of said action spaces.

4,065,132

MAZE PUZZLE

William Giakas, 2008 Grant Ave., South Plainfield, N.J. 07080

Filed Feb. 17, 1976, Ser. No. 658,762
Int. Cl.[2] A63F 9/08
U.S. Cl. 273—153 R **3 Claims**



1. An improved maze puzzle of the type wherein there is a cylindrical container whose inner wall has a plurality of spaced raised portions to form horizontal trackways with at least one transverse slot to connect the said trackways, said trackways and transverse slots being disposed to constitute a maze, said maze including a plurality of blind stops and having an axial shaft passing rotatably through end walls attached to the cylindrical container, which axial shaft has a laterally extending arm on said shaft, the outer end of the arm riding in one of the said trackways, wherein the improvement comprises:

a. An inner cylinder, replacing said axial shaft and end walls, dimensioned to telescope within said container, having a laterally extending arm slightly shorter than the depth of the raised portions, and being slideably insertable into the cylindrical container so that the laterally extending arm may ride in said trackway, said cylindrical container consisting of a plurality of segments, having fiduciary marks at each segment end, each segment being insertable into any other segment in random order such that, when the fiduciary marks are aligned, a completed maze puzzle is formed from one end of the assembled segmented cylindrical container to the other

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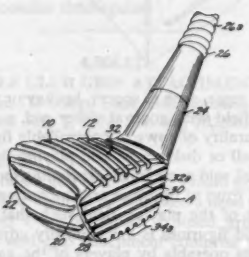
4,065,133

GOLF CLUB HEAD STRUCTURE

Ambrose L. Gordos, 4301 E. 2nd St., Long Beach, Calif. 90803

Filed Mar. 26, 1976, Ser. No. 670,733
Int. Cl.[2] A63B 53/04
U.S. Cl. 273—167 E **2 Claims**



1. In combination with a golf club shaft having a first end portion, a golf club head having a top surface, a flat bottom surface, first and second side surfaces, a flat leading ball striking surface and a trailing surface, and a tubular member that extends upwardly from said golf club head and has said first end portion of said shaft situated within the interior thereof and

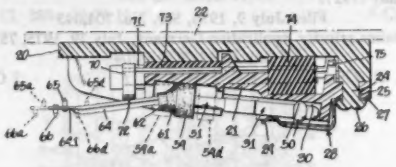
bonded thereto, said golf club head being characterized by a plurality of spaced substantially parallel grooves defined therein that extend inwardly from each of said top, bottom and second side surfaces and said grooves on said top and bottom surfaces extending from said leading ball striking surface to said trailing surface, with said plurality of grooves as said club is swung having air flowing rearwardly therethrough and acting as directional vanes to maintain said club in a desired arcuate path to minimize twisting of the club and forcing said ball striking surface to remain normal to said arcuate path during impact with a golf ball, and said grooves in said bottom surface lessening the area of the latter that may contact the ground surface just prior to impact with a golf ball, and this lessened bottom surface lessening the frictional drag that results from contact between said bottom surface and ground surface wherein increased kinetic energy is transferred from said golf club heat to said golf ball to drive the latter, with the major portion of said club formed from wood and said ball striking surface defined by a non-metallic plate secured to the leading surface of said wood portion, and said grooves defined in said top and bottom extending through the top and bottom edge portions of said plate.

4,065,134

NEEDLE ASSEMBLIES FOR PHONOGRAPH PICKUP CARTRIDGES

Henry J. Cvetko, and John L. Kuykendall, both of Conneaut, Ohio, assignors to The Astatic Corporation, Conneaut, Ohio

Filed Dec. 2, 1975, Ser. No. 637,078
Int. Cl.[2] G11B *3/02*; H04R *1/18, 17/08*
U.S. Cl. 274—37 **6 Claims**



1. In a phonograph cartridge having housing means adapted to be connected to the tone arm of a phonograph, at least one mechanoelectric transducer carried by said housing means and adapted to generate electric signal output when flexed, and a drive member connected to one end of said transducer and extending therefrom, the improvement in a needle assembly for and connectable to said housing means, comprising:

a body to be held to said housing means,

an elongated stud slidable within an opening in said body for longitudinal movement relative thereto and having a free end extending from said body,

a coupler member secured to said stud free end,

a stylus rod having one end connected to said coupler member and having a stylus point at its free end and adapted to engage in a groove in a rotatably supported phonograph record and thereby cause movement of said stylus rod, said stylus rod being adapted to be engaged by said drive member whereby movement of the former causes flexing of said transducer,

longitudinal movement of said stud relative to said body causing corresponding longitudinal movement of said stylus rod,

whereby when said needle assembly is connected to said housing means, said drive member may be engaged with said stylus rod at various positions along the length of the latter,

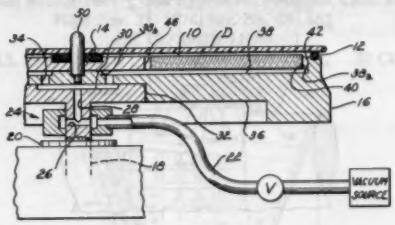
said body opening having a series of spaced grooves, and said stud having a detent seatable within a selected groove, whereby to releasably hold said stylus stud in a desired position.

4,065,135

TURNTABLE FOR RECORD DISC

Robert L. Doughty, 36 Sylvan Ave., West Hartford, Conn. 06107

Filed June 17, 1976, Ser. No. 697,197
Int. Cl.[2] G11B *3/60*
U.S. Cl. 274—39 R **5 Claims**



1. A turntable for relatively thin flexible phonographic record disc having recording grooves formed in both sides thereof, said turntable having a center locating pin and resilient means surrounding said locating pin, annular resilient means supporting the disc adjacent its periphery, an annular platen of inflexible impervious material having a flat rigid uninterrupted upper surface spaced below the underside of the flexible record disc when the disc is in a first position supported by said resilient means, a source of vacuum, turntable structure defining an annular cavity of greater radial extent than that of said annular platen and having a floor supporting said inflexible impervious platen, and said turntable structure defining internal passageways which communicate with radially extending grooves in the floor of said annular cavity, means rotatably supporting said turntable structure, fluid coupling means providing communication between said internal passageways defined by said turntable structure and said vacuum source, said turntable structure cavity having an outer wall defining annular opening means between said cavity wall and the outer periphery of said annular platen, and said internal passageways and radial grooves providing communication between said vacuum source and said annular opening means, vacuum at said opening means being adapted to draw the disc downwardly compressing both said resilient means until the underside of the disc abuts said flat rigid upper surface of said inflexible impervious platen.

4,065,136

SHAFT SEAL ASSEMBLY FOR A ROTARY MACHINE

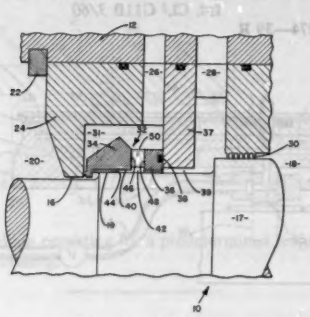
William H. Miller, Jr., Bethlehem, and Carl H. Geary, Greensburg, both of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 21, 1977, Ser. No. 761,093
Int. Cl.[2] F16J *15/42*
U.S. Cl. 277—3 **6 Claims**

1. In a fluid shaft seal assembly for use in a rotary machine wherein the working fluid contained within the machine is prevented from escaping about the shaft by a high pressure fluid barrier maintained between the shaft and the machine frame, the improvement comprising:

a seal member encircling said shaft and comprising a pressure breakdown bushing for throttling the seal fluid from an injection region of high pressure to a region of lower pressure as the fluid moves between the shaft and the bushing, and a seal ring integrally connected to said bushing to prevent the working fluid of said rotary machine from escaping into said low pressure region, said breakdown bushing of said seal member including an axially extending constant diameter step portion adjacent to said high pressure injection region and spaced from said shaft a relatively small distance to define therebetween a restircted flow path for said high pressure fluid moving from said injection region toward said low pressure region, the

flow of fluid through said restricted flow path developing a radially acting hydrostatic force on the surface of said step portion, with the center of gravity of said seal member being located above the center of said step portion whereby the hydrostatic force developed on said step portion radially centers said seal member with respect to said shaft.

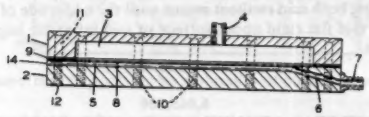


4,065,137

PLASMA-PROCESS VACUUM SEAL

Werner Rueggeberg, and Joseph J. Wiker, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 24, 1976, Ser. No. 717,109
Int. Cl.[2] F16J *15/14*
U.S. Cl. 277—34 **5 Claims**



1. A vacuum seal adapted to permit continuous passage of filamentous material therethrough to a vacuum system, said seal comprising:

a. a first rigid body member having at least one substantially flat surface with a fluid-receiving chamber extending inwardly therefrom;

b. a second rigid body member having at least one substantially flat surface with a longitudinal groove therein extending from one end of the body to a point spaced inwardly from the other end thereof;

c. means for fastening said body members together with said chamber and said groove in opposed relation to each other;

d. a flexible membrane positioned between the body members and covering said chamber and said groove;

e. means on said first body member in communication with said chamber for supplying fluid under pressure thereto;

f. attaching means on said second body member for attaching said seal to a vacuum system; and

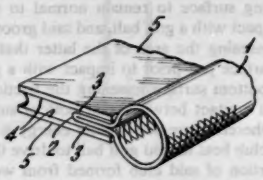
g. means connecting said groove to said attaching means so that the material may pass from the groove through said connecting and attaching means into the vacuum system.

4,065,138

METAL MESH STRIP AND EMBEDDED FIN GASKET FOR SHIELDING AGAINST ELECTROMAGNETIC INTERFERENCE

John Severinsen, Middletown, N.J., assignor to Metex Corporation, Edison, N.J.

Filed Mar. 7, 1977, Ser. No. 774,805
Int. Cl.[2] F16J *15/00*
U.S. Cl. 277—230 **22 Claims**



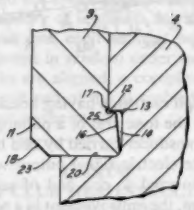
1. A gasket comprising a tubular metal wire mesh strip having a longitudinal fin; said fin being surrounded by a thin flexible layer; said layer having two major faces that are generally flat and parallel to said fin; a thin, generally-flat, flexible ribbon affixed to one of said faces, said ribbon being at least as stiff as said layer; the fin, the layer, and the ribbon forming a flexible member which is thinner than the diameter of the tubular portion of the metal mesh strip.

4,065,139

DRILL CHUCK

Günter Horst Röhm, Heinrich-Rohm-Str. 50, Sontheim, Germany (7927)

Filed July 9, 1976, Ser. No. 704,045
Claims priority, application Germany, July 29, 1975, 7524037
Int. Cl.[2] B21B *31/04*
U.S. Cl. 279—62 **2 Claims**



2. A method of assembling a chuck comprising the steps of:

forming a sleeve with an internal circumferential groove spaced from a forward end thereof;

fitting said sleeve over an externally toothed ring having an external circumferential groove defined between a rearwardly-facing flank and a forwardly-facing flank constituting a shoulder having an edge so that said end rests against said rearwardly-facing flank and said internal groove is juxtaposed with said shoulder, said ring being mounted on a chuck body for actuation of chuck bodies carried thereby; and

upsetting said end of said sleeve into said external groove, thereby substantially enclosing said edge in said internal groove.

4,065,140

SKI SEAT

Louise G. Cadwalader, P.O. Box 135, Homewood, Calif. 95718

Filed Jan. 27, 1976, Ser. No. 652,668
Int. Cl.[2] A63C *11/00*; A47C *9/10*
U.S. Cl. 280—11.37 E **8 Claims**

1. A portable seat to be suspended between a pair of ski poles

comprising a narrow elongated fabric web having a pocket formed at each end of the web facing toward the center, said fabric web comprising essentially a flattened tube having two layers of superposed fabric material, the two layers of material being formed together across their entire width along a short length of the respecting opposite ends of web to define the

bottom of the respective pockets at each end, a pair of slits being produced in one layer of said fabric to provide access to the interior of each of the respective pockets to thereby permit the pockets to receive the upper extremities of the ski poles to suspend the medial portion of the web between the pair of poles.

4,065,141

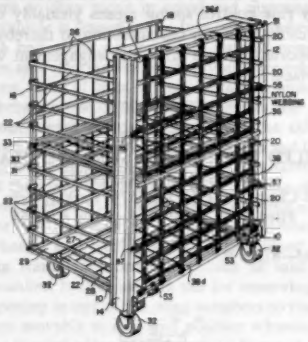
BULK MAIL CONTAINER

James D. Wilson, Newport Beach, Calif., assignor to Banner Metals Div. of Intercole Automation, Compton, Calif.

Continuation-in-part of Ser. No. 688,143, May 20, 1976, abandoned. This application Dec. 13, 1976, Ser. No. 749,732

Int. Cl.[2] B62B *11/00*

U.S. Cl. 280—33.99 H **6 Claims**



1. A container for bulk mail, and the like comprising: a lower U-shaped horizontal frame having a rear member and side members which diverge outwardly from the rear member and which define an open front; a plurality of spaced and parallel upright posts mounted on the frame at the front and rear thereof; a rectangular-shaped intermediate shelf; a rectangular-shaped intermediate frame surrounding said intermediate shelf, said intermediate frame having a forward edge and a rear edge and being upwardly turnable from a generally horizontal position to an upright position to permit other like containers to be received in the open front of the container; means pivotally mounting the rear end of said intermediate shelf and of said intermediate frame to the posts at the rear of said horizontal frame to permit the intermediate shelf and the intermediate frame to be upwardly turnable from a generally horizontal load-supporting position to an upright position; bracket means mounted on the posts at the front of the horizontal frame to support the intermediate frame in a generally horizontal position; and upper and lower gate members to the forward edge of the intermediate frame to be adjustable to positions enclosing the open front of the container when the intermediate frame is turned down to its generally horizontal position in which the upper gate encloses the area above the intermediate frame and the lower gate encloses the area below the intermediate frame.

4,065,142

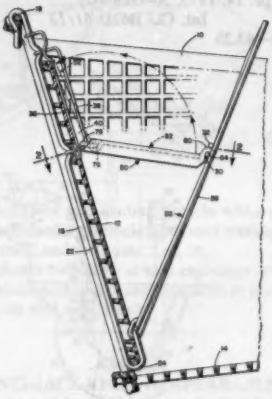
CHILD SEAT FOR CART

Houston Rehrig, 1401 S. Oak Knoll Ave., Pasadena, Calif. 91109

Filed Apr. 29, 1976, Ser. No. 681,462

Int. Cl.[2] B62B *11/00*

U.S. Cl. 280—33.99 B **20 Claims**



1. A foldable child seat for a grocery cart or the like having a cart rear panel provided with at least one leg opening, and a pair of substantially vertically extending slide wires said child seat comprising:

a movable seat back frame pivotally attached to said cart rear panel and movable between an open position pivoted away from said cart rear panel and a closed position adjacent to said cart rear panel,

a plastic seat panel pivotally attached at its forward edge to said seat back frame and at its rear edge to a rear support wire, said rear support wire being slidably mounted on the slide wires provided on said cart rear panel so that said seat panel can be moved from a generally horizontal position when said seat back frame is in said open position to a generally vertical position when said seat back frame is in said closed position,

a plastic leg opening cover pivotally attached along one edge to said rear support wire and movable when said seat back frame is in its open position between a first position in superimposed relationship with said seat panel and a second position in superimposed relationship with said cart rear panel and covering said leg openings,

said rear edge of said seat panel comprising at least one first extension extending across less than the entire width of said seat panel and having a first recess in each said first extension for accommodating said rear support wire, said first recess opening in a first direction when said seat panel is generally horizontally oriented, said leg opening cover comprising at least one second extension at said one edge extending across less than the entire width of said leg opening cover and having a second recess in each said second extension for accommodating said rear support wire, said first and second extensions being in interdigitating relationship with one another, said second recess opening in a second direction substantially opposite to said first direction when said leg opening cover is in said first position, each one of said second recesses comprising an inner portion in which said rear support wire is accommodated and an entrance portion at least in part having a cross-sectional dimension less than the diameter of said

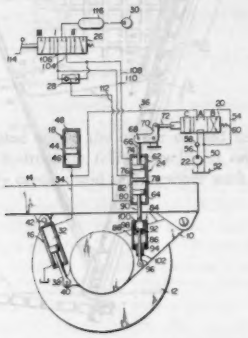
rear support wire so that said rear support wire must be forced through said entrance portion into said inner portion and is held therein.

4,065,143

FLUID SUSPENSION SYSTEM

Akio Iida, Kawasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 14, 1976, Ser. No. 678,593
Claims priority, application Japan, Apr. 14, 1975, 50-49282[U]; Apr. 14, 1975, 50-49283[U]
Int. Cl.² B62D *61/12*
U.S. Cl. 280—43.23 **4 Claims**



1. In a fluid suspension system for a vehicle having a suspension arm rotatably supporting each wheel of the vehicle adjacent one end and pivotally connected to a vehicle body at another end so as to permit up-and-down motion of the vehicle body relative to the wheel, wherein the suspension system is of the type comprising a cushioning jack operatively connected between the vehicle body and the one end of the suspension arm, an accumulator in constant communication with the cushioning jack, and a first source of fluid under presure for supplying pressurized fluid to the cushioning jack, the combination thereof with:

a. a height control valve operatively connected between said cushioning jack and said first source, said height control valve being normally held in a center position and displaced on actuation to either of two offset positions for communicating said cushioning jack with said first source or with a drain;

b. dual cylinder means comprising:

1. a first fluid actuated cylinder having a piston rod operatively connected to said height control valve for actuating same, said first cylinder having a first rod end chamber and a first head end chamber; and

2. a second fluid actuated cylinder having a piston rod operatively connected to said suspension arm, said second cylinder having a second rod end chamber and a second head end chamber, said second head end chamber being in constant communication with atmosphere;

3. said first and second cylinders being connected to each other with their head ends in opposed relationship;

c. a second source of fluid under pressure; and

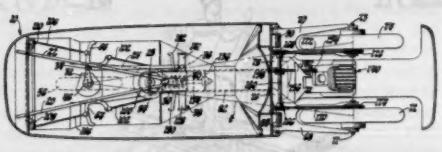
d. suspension control valve means for selectively communicating said second source with said first and second rod end chambers or with said first head end chamber and said second rod end chamber and thus for actuating said height control valve to either of said two offset positions, said suspension control valve means having a neutral setting where all said chambers of said dual cylinder means are communciated with atmosphere.

4,065,144

CAMBERING VEHICLE

Frank J. Winchell, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 11, 1975, Ser. No. 603,532
Int. Cl.² B60G *19/00*
U.S. Cl. 280—771 **6 Claims**



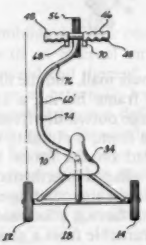
3. A steerable narrow track vehicle having a camber control system independent of steering comprising a vehicle body, steerable wheel means operatively supported by said body for limited turning movement about a substantially vertical steering axis, manual steering means operatively connected to said steerable wheel means for turning said steerable wheel means about said steering axis, a pair of arms extending longitudinally rearwardly from said body, pivot means securing said arms for limited swinging motion with respect to said body independent of said manual steering means, separate road wheel means rotatably mounted on each of said arms adjacent to the free ends thereof, connector cable means operatively connecting each of said arms to each other for equal movement in opposite directions, foot support means for receiving the left and right feet of a vehicle operator operatively connected to said connector cable to permit said operator to actuate said connector means and thereby camber said wheel means and said vehicle, and unitary ride control spring means yieldably urging said connector cable means in one direction to thereby urge said wheels supported by said arms into engagement with a supporting surface.

4,065,145

WHEELED VEHICLE FOR SEMI-AMBULATORY MEDICAL PATIENTS

Carter Carl Chambers, P.O. Box 576, Parker, Ariz. 85344

Filed Mar. 30, 1976, Ser. No. 671,755
Int. Cl.² B62K *3/16*
U.S. Cl. 280—87.02 R **5 Claims**



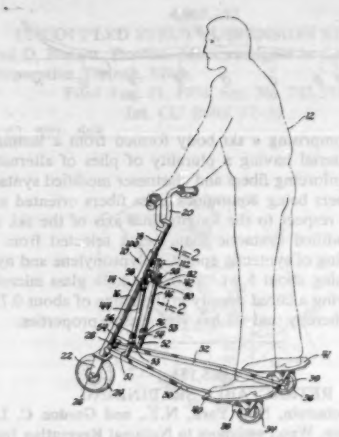
1. A patient vehicle comprising a support component comprising two spaced wheels, a seat, and means for supporting said seat on said wheels; a steering component comprising a wheel having steering means; means connecting said components and defining a center line dividing said vehicle into right and left parts, said means having a portion offset to one side of the center line of the vehicle to allow clearance for the feet of the user; said seat being positioned over the rear portion of said offset portion such that a patient may mount the seat without stepping over said offset portion.

4,065,146

CAMBERING DEVICE FOR CAMBERING VEHICLE

Richard E. Denzer, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 28, 1976, Ser. No. 727,591
Int. Cl.[2] B60G *19/00*; B62K *15/00*
U.S. Cl. 280—278 3 Claims



1. In combination with a cambering vehicle having a steering frame provided with a pair of pivotally supported trailing arms, a mechanical cambering device for interconnecting the trailing arms so they move in equal and opposite directions when the vehicle is leaned into a turn, said cambering device including a bell crank comprising a pair of wing members mounted on said steering frame for pivotal movement about a common axis, a pair of links, means pivotally connecting one of said links between one of said wing members and one of said trailing arms, means pivotally connecting the other of said links between the other of said wing members and the other of said trailing arms, each of said wing members having an opening formed therein, a locking pin carried by one of said wing members and adapted to be located in the opening in each wing member for securing said wing members together in a first position wherein said trailing arms are positioned relative to the steering frame for normal operation of said vehicle, a handle connected to said locking pin for removing the latter from the opening in one of the wing members so that the wing members are movable to a second position wherein said trailing arms are located adjacent said steering frame so the vehicle can be stowed in a minimum of space, and a lock device carried by said steering frame and including a pair of jaws for clamping said wing members therebetween and thereby maintaining said bell crank in a fixed position relative to said steering frame when said wing members are in either of said first or second positions.

4,065,147

SYSTEM FOR ALIGNING TRAILER HITCHES

John E. Ross, 1540 Casa Rio Drive, Orlando, Fla. 32807

Filed June 1, 1976, Ser. No. 691,370
Int. Cl.[2] B60D *1/16*
U.S. Cl. 280—477 3 Claims

1. A system for aligning a leading vehicle with a vehicle to be trailed, wherein said leading vehicle is of the type having two rearward windows in a direction facing said trailing vehicle, said system comprising:

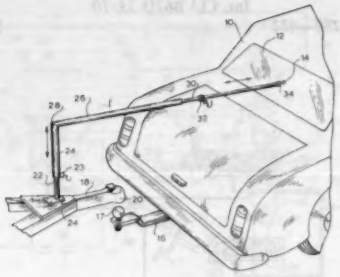
a mark on each of said rearward windows of said leading vehicle;

means for changing the dimension of said rod in a first direction toward said leading vehicle;

means for changing the dimension of said rod in a second direction substantially transverse to said first direction;

a rod mounted on said trailing vehicle, said rod dimensioned such that the extremity thereof contacts said window immediately adjacent said indicating means on said rearward window of said leading vehicle when proper alignment of said leading vehicle with said trailing vehicle has been effected; and wherein

said rod includes two arms at said extremity with each arm adapted to contact one of said windows at the corresponding mark on said windows.

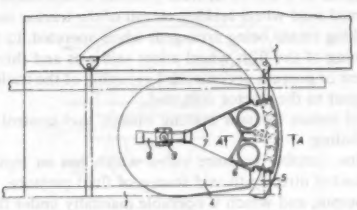


4,065,148

ANTI-JACK-KNIFING APPARATUS

László Koroknay, and Janos Urbantsok, both of Budapest, Hungary, assignors to Autoipari Kutato Intezet, Budapest, Hungary

Filed July 13, 1976, Ser. No. 704,946
Claims priority, application Hungary, July 14, 1975, AU 345
Int. Cl.[2] B62D *53/08*
U.S. Cl. 280—432 4 Claims

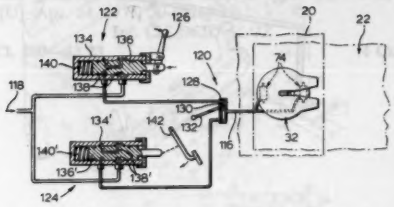


1. An anti-jack-knifing apparatus for an articulated vehicle including two members, namely a tractor (1) and a trailer (2), and a king-pin (3) for articulating said members together, the apparatus comprising a brake disc mechanism arranged coaxially with said king-pin and having cooperating braking elements (5) respectively connected to said tractor and to said trailer; a hydraulic pressure source (8) having a stationary part and a movable part (9), said stationary part being connected to one of said members (1, 2) while said movable part is connected to the other member; two working chambers (14, 15) and a throttle opening (13) being defined in said pressure source to establish throttled flow communication between said chambers; a plurality of brake cylinders (19); ducting connecting said cylinders with said chambers; and a respective controllable throttling valve unit (18*a*, 18*b*) in said ducting, each valve unit including a by-pass duct (17*a*, 17*b*) and a non-return valve (16*a*, 16*b*); wherein said braking elements are constituted by a brake disc formed as an arcuate segment (5) arranged on said trailer and a floating brake calliper (6) sandwiching said disc; and a coupling mechanism (4) on said tractor; a V-shaped groove (7) being defined in said coupling mechanism, and said brake calliper being fixed in said groove.

4,065,149
ANTI-JACKKNIFE APPARATUS

Bernard E. Roth, Barrie, Canada, assignor to Safe Track Manufacturing Limited, Burlington, Canada

Continuation-in-part of Ser. No. 626,146, Oct. 28, 1975, abandoned. This application May 24, 1976, Ser. No. 689,302
Int. Cl.[2] B62D *53/10*
U.S. Cl. 280—432 5 Claims



1. A tractor unit having an anti-jackknife apparatus and including:

a fifth wheel formed with a slot to receive a coupling pin on a trailer to be coupled to the tractor unit;

bearing means disposed between the fifth wheel and the tractor unit and adapted to permit the fifth wheel to turn with respect to the tractor unit about an upright axis;

means for preventing a trailer coupled to the tractor unit from turning with respect to the fifth wheel, the trailer and fifth wheel turning together about said axis when the tractor unit is coupled to a trailer and is negotiating a turn in use;

braking means associated with the fifth wheel and including at least one fluid pressure operated actuator adapted to be coupled to a source of fluid pressure independent of the normal road wheel braking circuit of the tractor unit, said braking means being arranged, when operated, to restrict turning of the fifth wheel about said axis and thereby to arrest or prevent uncontrolled swinging of the trailer with respect to the tractor unit; and,

control means for said braking means, said control means including:

a first variable pressure valve which has an input connected directly to said source of fluid pressure, and an output, and which is operable manually under the control of a driver of said tractor unit in use to vary the fluid pressure at said output of the valve;

a second variable pressure valve disposed in parallel with said first variable pressure valve and having an input connected directly to said source of fluid pressure, and an output, and which is coupled to a foot brake of the tractor unit so that the valve is operated in response to operation of the foot brake to vary the fluid pressure at said output of the valve; and,

a selector valve which has an output coupled to said actuator of the braking means, first and second inputs coupled respectively to the outputs of said first and second variable pressure valve, and a valve member which is movable between a first position in which the first input of the selector valve is coupled to said output so that the braking means are controlled exclusively by said first variable pressure valve under the control of a driver of the tractor unit, and a second position in which said second input of the selector valve is coupled to said output and said braking means is operated exclusively by said second variable pressure valve under the control of the foot brake of the tractor unit.

4,065,150
SKI AND METHOD OF MAKING SAME

Richard L. Van Auken, Bridgewater, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

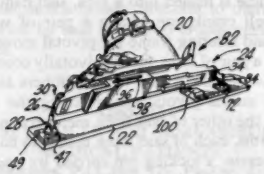
Filed Jan. 26, 1976, Ser. No. 652,331
Int. Cl.[2] A63C *5/12*
U.S. Cl. 280—610 17 Claims

1. A ski comprising a ski body formed from a laminated structural material having a plurality of plies of alternating laminae of reinforcing fibers and elastomer modified syntactic foam, said fibers being continuous glass fibers oriented at 0° and 90° with respect to the longitudinal axis of the ski, said elastomer modified syntactic foam being selected from the group consisting of syntactic epoxy, polypropylene and nylon foams containing about 5 wt. % to 30 wt. % glass microballoons and having a cured density in the range of about 0.75 to 1.0 gm/cc, whereby said ski has viscoelastic properties.

4,065,151
RETRACTABLE SKI BINDING

Burton A. Weinstein, New York, N.Y., and Gordon C. Lipe, Teton Village, Wyo., assignors to National Recreation Industries, Inc., Westport, Conn.

Filed Feb. 27, 1976, Ser. No. 662,108
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—618 14 Claims



1. A ski binding comprising:

boot-engaging means adapted for detachable connection to a ski boot;

mounting means adapted for attachment to a ski;

leash means for connecting said boot-engaging means and said mounting means and applying a tension force therebetween to yieldably resist separation of said boot-engaging means and said mounting means, said leash means being extendable to permit said boot-engaging means and said mounting means to separate and retractable to draw them back together;

force-transmitting link means mounted on one of said boot-engaging means and mounting means, and coupled to said leash means; and

engagement means on the other of said boot-engaging means and mounting means which engages said force-transmitting link means to vary the effectiveness with which such tension force is applied as a function of leash extension.

8. A ski binding comprising:

boot-engaging means adapted for detachable connection to a ski boot;

leash means for connecting said boot-engaging means to a ski and applying a tension force therebetween to yieldably resist separation of said boot-engaging means from the ski, said leash means including an elongated, flexible cord;

connecting means for attaching said leash means to said ski; and

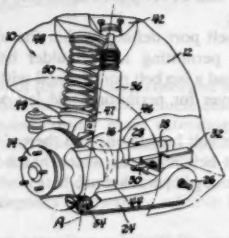
cooperating means including engagement means carried by said boot-engaging means which engage with a rigid link connected to said cord when said boot-engaging means and ski are in close proximity to one another for enhancing the effectiveness with which said tension force is applied by said leash means between said boot-engaging means and said ski.

4,065,152

UNCOUPLED STRUT SUSPENSION SYSTEM

Alfred D. Bodnar, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 11, 1976, Ser. No. 713,373
Int. Cl.² B60K *17/30*
U.S. Cl. 280—668 **4 Claims**



1. A low profile, uncoupled strut suspension system for a motor vehicle having an undercarriage supporting a body, and a road wheel operatively connected to said undercarriage, said system comprising a laterally extending control arm having its inner end pivotally connected to said undercarriage, a steering knuckle pivotally connected to the outer end of said control arm for rotatably supporting said wheel, a vertically oriented shock absorber having its lowe. end extended adjacent and below the axis of said wheel and secured to said steering knuckle and its upper end pivotally connected to said body at a point which together with the axis of the pivotal connection between the steering knuckle and the control arm defines a predetermined kingpin axis, an upper retainer bracket formed on said body adjacent said upper end of said shock absorber and a lower retainer bracket formed on one of said steering knuckle and said shock absorber members substantially coincident with said kingpin axis for minimizing bending moments across said shock absorber, and a vertically oriented coil spring mounted between said upper and lower retainer brackets, said upper and lower retainer brackets serving to retain the respective ends of said coil spring during turning operations.

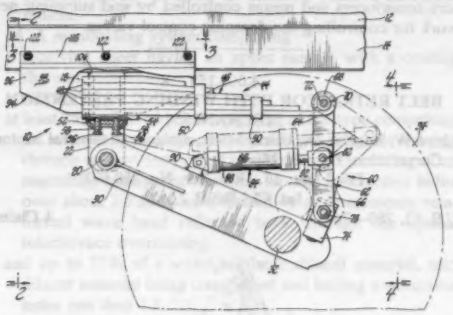
4,065,153

VEHICLE WHEEL SUSPENSION ASSEMBLY

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 19, 1976, Ser. No. 715,886
Int. Cl.² B60G *11/12*
U.S. Cl. 280—704 **15 Claims**

1. A vehicle wheel suspension assembly capable of moving a vehicle wheel between a surface-engaging position and a retracted position, said assembly comprising: a support structure, bracket means for attaching said support structure to a vehicle, an arm for rotatably supporting a vehicle wheel, said arm being pivotally connected to said support structure to permit reciprocal movement of said arm in a generally vertical plane, resilient means supported by said support structure, and combined connecting and lifting means connecting the free end of said arm to said resilient means; said connecting and lifting means being movable between a first mode in which the vehicle wheel is in a surface-engaging position and a second mode in which said vehicle wheel is in a retracted position, said connecting and lifting means including a collapsible link connected between the free end of said arm and said resilient means which maintains a fixed distance of separation between the points of connection when said connecting and lifting means is in said first mode and causes a reduction in the distance of separation upon collapse when said connecting and



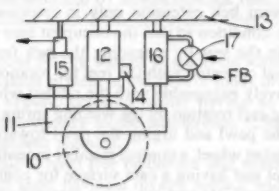
lifting means is moved toward said second mode to move said arm toward resilient means and control means operatively connected to said collapsible link for selectively moving said connecting and lifting means between said first and second modes.

4,065,154

VEHICLE SUSPENSION SYSTEMS

Stanley George Glaze, Brierley Hill, England, assignor to Lucas Industries Limited, Birmingham, England

Filed June 7, 1976, Ser. No. 693,179
Claims priority, application United Kingdom, June 7, 1975, 24595/75
Int. Cl.² B60G *9/00*
U.S. Cl. 280—707 **5 Claims**



1. A vehicle suspension system comprising a plurality of hydraulic suspension units for respective wheels of the vehicle, electro-hydraulic transducer means associated with each hydraulic suspension unit and producing an electrical output corresponding to the hydraulic pressure in the associated suspension unit, a plurality of wheel velocity transducers associated respectively with the suspension units and each producing an electrical signal corresponding to the velocity of movement of the associated wheel axis relative to the vehicle body, a plurality of damping control valves associated respectively with the respective suspension units and control means for the damping control valves, said control means having inputs from the pressure transducers and the velocity transducers and providing outputs to vary the damping effect of each damping valve so as to establish a desired functional inter-relationship between the pressure and velocity signals, the control circuit including means for generating an electrical signal dependent on the difference between the average velocity sensed by a pair of the velocity transducers associated with a front pair of wheels of the vehicle, and the average velocity sensed by a further pair of the velocity transducers associated with a rear

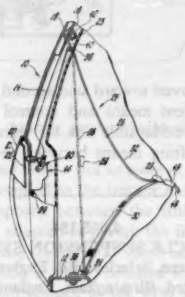
pair of wheels of the vehicle, a signal generating circuit connected to said signal generating means and producing an electrical output signal corresponding to the desired value of the difference between the front and rear pressure transducer signals, a summing network for combining the signal from the signal generating means with a signal derived from the pressure transducers and means controlled by said summing network for controlling the damping control valves.

4,065,155

BELT RETRACTOR WITH WINDING PREVENTION MECHANISM

Lloyd W. Rogers, Jr., Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 15, 1976, Ser. No. 750,692
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—744 **4 Claims**



1. In combination, an automotive vehicle having an occupant seat, a restraint belt for restraining an occupant in the seat, a reel having the belt wound thereon, a winding spring urging belt winding reel rotation to retract the belt on the reel and pull the belt taut against the occupant, a locking mechanism effective to prevent belt extension only in response to a sensed acceleration condition so that the occupant may normally lean forwardly in the seat by extending the belt from the reel, a ratchet wheel conneted with the reel for rotation therewith, a pawl selectively engageable with the ratchet wheel to prevent belt winding reel rotation by the winding spring, spring means acting on the pawl and urging the pawl toward engagement with the ratchet wheel, a control member mounted for rotation with the reel and having a cam surface for controlling movement of the pawl into and out of engagement with the ratchet wheel in response to a predetermined sequence of rotation of the control member, said spring means going overcenter upon predetermined movement of the pawl away from engagement with the ratchet wheel so that the spring holds the pawl in a disabled condition irrespective of rotation of the control member to a position which would otherwise engage the pawl with the ratchet wheel, and said control member having cam means thereof adapted to operate the pawl to and from the disabled position.

4,065,156

SEAT BELT SYSTEM

Yutaka Tanaka, Aichi; Yutaka Kondo, Toyota, and Akira Yamanaka, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 12, 1976, Ser. No. 675,782
Int. Cl.[2] B60R *21/02*
U.S. Cl. 280—747 **1 Claim**

1. A vehicle seat belt system for reducing the effective load impressed upon the seat belt fitting which secures the seat belt retractor means to the vehicle, comprising:

belt means integrally defining a shoulder belt and a lap belt;

a first slip joint secured to the upper part of an interior side wall of a center pillar of said vehicle;

a second slip joint secured to a rocker panel disposed within the floor region of said vehicle;

a tongue plate disposed upon said belt means;

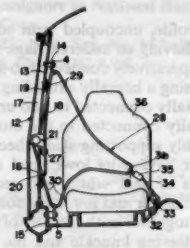
said center pillar extending vertically and being provided with a hollow portion access to which is provided by means of a window defined within said interior side wall of said pillar;

a cover disposed over said window for covering said window;

seat belt retractor means comprising two seat belt retractors disposed within said hollow portion of said center pillar, said retractors being arranged vertically in a series so as to define upper and lower seat belt retractors and being mounted upon a common retractor fitting secured to the surface of said cover which faces said hollow portion of said pillar;

a shoulder belt port defined within the upper part of said cover for permitting said shoulder belt to pass therethrough, and a lap belt port defined within the lower part of said cover for permitting said lap belt to pass therethrough;

said shoulder belt having one end thereof wound upon said upper seat belt retractor which has a belt port defined within the upper part thereof;



said lap belt having one end thereof wound upon said lower seat belt retractor which has a belt port defined within the lower part thereof;

said shoulder belt extending upwardly from said upper seat belt retractor and through said upper seat belt retractor belt port and said shoulder belt port defined within said cover so as to pass through said first slip joint and extend toward said tongue plate;

said lap belt extending downwardly from said lower seat belt retractor and through said lower seat belt retractor belt port and said lap port defined within said cover so as to pass through said second slip joint and extend toward said tongue plate; and

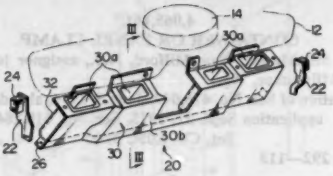
the other ends of said shoulder and lap belts being passed through said tongue plate,

whereby as a result of said mounting of said two seat belt retractors upon said common fitting, and said upward disposition of said shoulder belt from said upper seat belt retractor to said first slip joint as well as said downward disposition of said lap belt from said lower seat belt retractor to said second slip joint, when said vehicle is suddenly decelerated, forces will be transmitted through said shoulder and lap belts to said common fitting, yet the net effective force impressed upon said common fitting will be equal only to the difference in the magnitudes of said forces transmitted through said shoulder and lap belts.

4,065,157
KNEE PROTECTOR

Fumiyuki Abe; Kazuo Ikawa, both of Yokohama; Mituo Ehama, Yokosuka, and Naoki Ogawa, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed June 1, 1976, Ser. No. 691,942
Claims priority, application Japan, June 6, 1975, 50-76644[U]
Int. Cl.[2] B60R *21/04*
U.S. Cl. 280—751 6 Claims



1. A knee protector for protecting knees and legs of a vehicle seat occupant upon collision of the vehicle comprising:
- a lateral elongated bottom panel extending between and anchored to both side walls of an occupant space defined by the body of the vehicle, substantially in juxtaposition to the knees of the seated occupant, said bottom panel having a rear end disposed rearwardly relative to the vehicle body,
- an upright panel extending substantially upright from the rear end of the bottom panel and having a plurality of laterally spaced openings facing the chest of the seated occupant, and
- a plurality of box-shaped crushable elements mounted in the openings in the upright panel, each of said elements extending forwardly of the vehicle body from the upright panel, each of said elements having a generally cenral axis in a vertical plane parallel to the longitudinal axis of the vehicle and substantially parallel to the bottom panel, each of said elements having an opening in alignment with the corresponding one of said openings in the upright panel, said elements being collapsible by the knees of the occupant upon collision of the vehicle.

4,065,158
RECORDING SHEET FOR FORMING INTENSELY COLORED IRIDESCENT INDICIA

Chester Davis, 415 E. Fifth St., Newport, Ky. 41071

Filed Feb. 13, 1975, Ser. No. 549,706
Int. Cl.[2] B41L *1/36;* B41M *5/12, 5/16*
U.S. Cl. 282—27.5 18 Claims

1. A recording sheet comprising, a colorless base web having a substantially white surface coating comprising,
- an iridescent pigment of the type comprising an essentially transparent micaceous substrate having thereon at least one optical interference overcoating of an essentially transparent material having a refractive index over about 2.0 and characterized by an interference reinforced wave band reflected back from the optical interference overcoating,
- and an organic solvent-free binder for said iridescent pigment.

13. A manifolding system comprising
- a receiving sheet having an upper surface with a coating thereon comprising
- an iridescent pigment of the type comprising an essentially transparent micaceous substrate having thereon at least one optical interference overcoating of an essentially transparent material having a refractive index over about 2.0 and characterized by an interference reinforced wave band reflected back through the optical interference overcoating,
- and a binder for said pigment,
- and a transfer sheet having a reverse surface with a coating thereon comprising an encapsulated dye solution, said solution having an absorption band complementary to the interference reflection color of the iridescent pigment,
- said transfer sheet being arranged so that pressure on the top surface transfers the dye solution to the receiving sheet surface, thereby forming an intensely colored iridescent indicia.

14. A manifolding system comprising
- a receiving sheet having an upper surface with a coating thereon comprising
- a mixture of
- at least 25% of an iridescent pigment of the type comprising an essentially transparent micaceous substrate having thereon at least one optical interference overcoating of an essentially transparent material having a refractive index over about 2.0 and characterized by an interference reinforced wave band reflected back through the optical interference overcoating,
- and up to 75% of a water-insoluble diluent material, said diluent material being transparent and having a refractive index less than 1.8,
- and a binder for said mixture,
- and a transfer sheet having a reverse surface with a coating thereon comprising an encapsulated dye solution, said solution having an absorption band complementary to the interference reflection color of the iridescent pigment,
- said transfer sheet being arranged so that pressure on the top surface transfers the dye solution to the receiving sheet surface, thereby forming an intensely colored iridescent indicia.

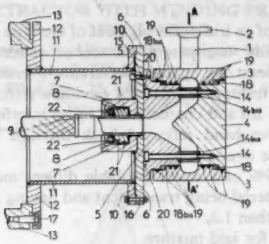
17. A manifolding system comprising
- a receiving sheet having an upper surface with a coating thereon comprising
- a mixture of
- an iridescent pigment of the type comprising an essentially transparent micaceous substrate having thereon at least one optical interference overcoating of an essentially transparent material having a refractive index over about 2.0 and characterized by an interference reinforced wave band reflected back from the optical interference overcoating,
- and up to about 5% by weight of a solvent soluble organic coloring matter present in the form of finely divided particles, said organic coloring matter having an absorption band complementary to the interference reflection color of the iridescent pigment,
- and an organic solvent free binder for said mixture,
- and a transfer sheet having a reverse surface with a coating thereon comprising an encapsulated solvent for the finely divided particles,
- said transfer sheet being arranged so that pressure on the top surface thereof transfers the solvent for the particles to the receiving sheet where it dissolves the particles and spreads the said coloring matter over the iridescent pigment thereby forming an intensely colored indicia.

18. A self-contained substantially colorless recording sheet comprising a colorless base web having thereon a coating comprising
- a mixture of
- an iridescent pigment of the type comprising an essentially transparent micaceous substrate having thereon at least one optical interference overcoating of an essentially transparent material having a refractive index over about 2.0 and characterized by an interference reinforced wave band reflected back from the optical interference overcoating,
- and up to about 5% by weight of an encapsulated dye solution of an organic coloring matter, said solution having an absorption band complementary to the interference reinforced reflection wave band of the iridescent pigment,
- and an organic solvent-free binder for said mixture.

4,065,159
ROTARY CONNECTOR

Pierre Leroy, Saint-Germain-en-Laye, and Emile Sprunck, Moyeuvre-Grande, both of France, assignors to E. Sprunck, Moyeuvre-Grande and Creusot-Loire, Paris, both of, France

Filed Jan. 9, 1976, Ser. No. 647,766
Claims priority, application France, Jan. 22, 1975, 75.01925
Int. Cl.[2] F16L *27/08*
U.S. Cl. 285—136 12 Claims

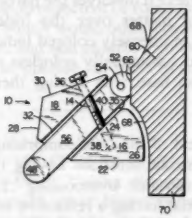


1. A rotary connector for connecting a fixed pipe to a movable pipe for fluid flow therebetween, the connector comprising a cylindrical stator having an inlet for supplying fluid thereto tangentially of the axis of said stator and adapted to be coupled to the fixed pipe, and a rotor projecting within said stator and rotatable about the axis of said stator, said rotor having an outlet extending in a direction perpendicular to the plane of said tangential inlet and connectable to the movable pipe, the rotor comprising a plurality of demountable parts, said stator having an inner surface and being provided, on its inner surface, with oppositely directed shoulders, said rotor comprising first and second main bodies received by said stator and abutting the respective shoulders on said stator, said bodies having spaced opposed faces between which said inlet opens and which faces are shaped to cause fluid to flow in the direction of said axis, said outlet being formed in said second body, means for releasably connecting said first body to the second body and means for sealing the joint between said first and second bodies and said stator.

4,065,160
ANTI-VANDALISM LOCK DEVICE FOR PANIC-TYPE DOORS

David D. Gilmore, Jr., 129 Miller Road, Kingwood, W. Va. 26537

Filed Dec. 13, 1974, Ser. No. 532,619
Int. Cl.[2] E05C *19/18*
U.S. Cl. 292—92 9 Claims



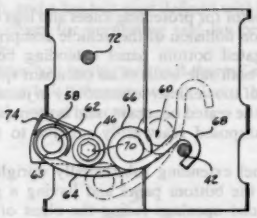
1. A lock device for use upon a panic-type door assembly which includes a transversely extending panic-bar pivotably supported by means of pivotable lever arms operatively connected in a locking assembly of said door and which is adapted to be depressed downwardly for actuating a locking mechanism disposed within said locking assembly, comprising:

means adapted to be secured to one of said pivotable lever arms and interposed between said one of said pivotable lever arms and said locking assembly of said door for preventing pivotable movement of said one of said pivotable lever arms and consequent actuation of said locking mechanism disposed within said locking assembly of said door as a result of a downward depression of said panic-bar; and p1 fastener means secured within said means for fixedly securing said means upon said one of said pivotable lever arms.

4,065,161
CONTAINER OR PANEL CLAMP

Edward MacMaster, New Milford, N.J., assignor to Rexnord Inc., Milwaukee, Wis.

Continuation of Ser. No. 476,049, June 3, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,164
Int. Cl.[2] E05C *5/00*
U.S. Cl. 292—113 4 Claims



1. A fastener assembly for securing a first member in assembled relationship with a second member which carries a strike including in combination, a first member having a pair of side walls formed with respective trunnion-receiving openings; an arm, a first hub on said arm, and trunnions on the ends of said hub received in said trunnion-receiving openings for mounting said arm on said first member for pivotal movement around a first axis between a first position and a second position, a drawhook of resilient material, said drawhook being formed with a complete loop intermediate the ends thereof, a hook at one end of said drawhook for engaging said strike, a second hub on said arm at a location spaced from said first hub, and a loop adjacent to the other end of said drawhook received by said second hub for mounting said drawhook on said arm for movement around a second axis spaced from said first axis and for movement between a retracted position corresponding to the first position of said arm and a latching position of said drawhook corresponding to the second position of said arm and in which latching position said second axis occupies a beyond-dead-center position with respect to said first axis, the arrangement being such that a plane perpendicular to said first and second axes extends through a portion of said drawhook mounting means and said loop adjacent to said arm mounting means in the latching position of said drawhook and flange acting interengageable flange on said arm abutting said drawhook in intermediate positions of said arm and said drawhook for moving said drawhook fully to its retracted position as said arm moves from its second position to its first position.

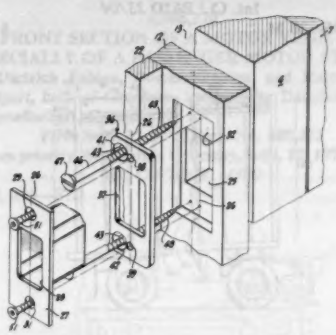
4,065,162
LOCK STRIKE CONSTRUCTION

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Sept. 20, 1976, Ser. No. 724,929
Int. Cl.[2] E05C *21/02*
U.S. Cl. 292—340 5 Claims

1. A lock strike construction for use with a wall having an upright structural cripple and an upright door casing side rail parallel to and separated from said cripple by an intervening space comprising an elongated planar plate having a longitudi-

nal axis, means defining an elongated bolt opening entirely enclosed in said planar plate and extending along and substantially symmetrical with said axis, means forming a pair of screw-receiving circular holes in said planar plate on said axis and on opposite ends of said bolt opening, means forming a pair of screw rod holes in said planar plate both on one side of said axis and on opposite ends of said bolt opening, a pair of screw rods in said screw rod holes and extending through said side



rail and through said space and into said cripple, a strike plate abutting said planar plate and said screw rods and in substantial registry with said planar plate, means defining a bolt opening and screw openings in said strike plate substantially registering with said elongated bolt opening and said screw receiving holes, and screw fasteners disposed in said screw receiving holes in said strike plate freely passing through said screw receiving circular holes in said planar plate and laterally engagable by both said strike plate and said planar plate.

4,065,163

STRIKE PLATE FOR HOOK BOLT LOCK SETS

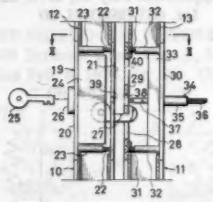
Mitsuo Nagase, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 30, 1976, Ser. No. 718,821

Claims priority, application Japan, Sept. 1, 1975, 50-121021[U]

Int. Cl.[2] E05C 5/02

U.S. Cl. 292—341.15 **3 Claims**



1. A hook bolt lock set for use on a pair of closure members slidable in adjacent planes and having a pair of overlapping stiles, comprising:

a. a lock for being mounted in one of the overlapping stiles, said lock having a hook bolt for spanning the space between said planes and capable of projection toward and retraction from the other overlapping stile in a direction normal to the planes in which the closure members are movable;

b. an invertible strike plate for being attached to said other overlapping stile in a position parallel to said planes, said strike plate having a central opening and a pair of apertures alternatively receptive of said hook bolt, and located one on each side of and symmetrically in position with respect to said central opening, one of said apertures being wider in width than the other; and

c. means connected to said plate and slidable through said central opening for actuating said lock from the side of said other overlapping stile.

4,065,164

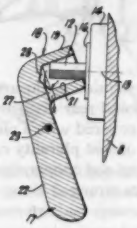
FIRE-SAFE LEVER HANDLE

Vernon A. Bartels, Alameda, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Nov. 26, 1976, Ser. No. 745,358

Int. Cl.[2] E05C 21/00

U.S. Cl. 292—347 **10 Claims**



1. A fire-safe lever handle comprising a lock spindle, means for supporting said spindle for rotation about a horizontal axis, a lever handle having a center of gravity off of said axis, a hub on said lever handle, a meltable material when solid interposed between and engaging said hub and said spindle against relative rotation, and means on said lever handle forming a drain for said material when melted.

4,065,165

DOOR HANDLE MECHANISMS

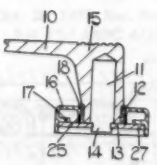
Richard David Hamblin, Birmingham, England, assignor to Archibald Kenrick and Sons Limited, West Bromwich, England

Filed Mar. 25, 1975, Ser. No. 561,950

Claims priority, application United Kingdom, Mar. 27, 1974, 13535/74; Mar. 27, 1974, 13544/74

Int. Cl.[2] E05C 21/00

U.S. Cl. 292—348 **14 Claims**

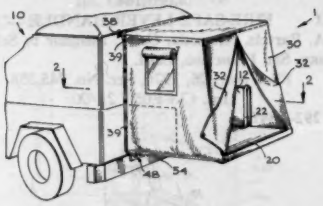


1. A door handle mechanism comprising a handle, a shank on said handle, the shank having a circular section bore therein, an attachment plate, the attachment plate having an opening therein, the shank being journalled in the opening in the attachment plate, a member non rotatably engaged on the shank and retaining it in the opening in the attachment plate, means for limiting angular movement of said handle with respect to said attachment plate, spring means arranged to oppose angular movement of said handle in one direction, two parallel inwardly presented edges on said member, said edges being disposed within the circular section bore in the shank and at least in part defining a hole shaped non-rotatably to engage a non-circular section spindle.

4,065,166
DEMOUNTABLE EXTENSION ENCLOSURE FOR MOTOR VEHICLES

Brian C. Shoemaker, 2707 W. 144th St., Gardena, Calif. 90249

Filed Aug. 26, 1976, Ser. No. 718,143
Int. Cl.[2] A45F *1/06*
U.S. Cl. 296—23 G 10 Claims



1. A demountable extension enclosure for a motor vehicle provided with an enclosed rear compartment having at least one doorway opening covered with a plurality of door panels, with two door panels of said plurality of panels comprising a substantially symmetrical and cooperating pair and being laterally openable on hinges arranged along the opposed, vertical side frames of said doorway, said extension enclosure comprising:

a flat floorboard substantially aligned with, and forming an outward, horizontal extension of, the floor of said vehicle compartment;

locating and securing means for maintaining and affixing said floorboard along the lower frame of said doorway, proximate to said floor;

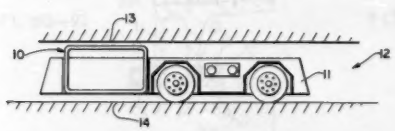
support means disposed on the inner face of each of said laterally openable doors and secured thereto for supporting said floorboard near its outboard edge; and

a flexible fabric housing attached to said vehicle and disposed about the sideboard and outboard edges of said floorboard, enclosing the volume defined by said floorboard in plan and the height of said vehicle compartment in elevation, said fabric housing being open with respect to the doorway of said vehicle.

4,065,167
SAFETY ENCLOSURE FOR MINING MACHINES

Newton E. Wright, P.O. Box 884, Lebanon, Va. 24266

Filed Sept. 16, 1976, Ser. No. 723,736
Int. Cl.[2] B62D *27/06*
U.S. Cl. 296—28 C 7 Claims



1. In a mining machine or the like, improved safety apparatus for protecting the operator thereof from overhead falls and the like comprising:

a. a cage-like enclosure for receiving and surrounding said operator while operating said machine;

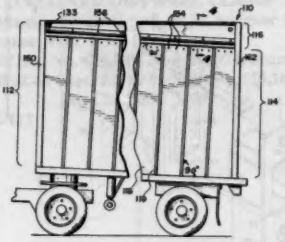
b. means in association with said machine and said cage-like enclosure for securing said cage-like enclosure to one side of said machine and for allowing sliding displacement of said cage-like enclosure relative to said machine in a vertical direction;

c. means for adjustably maintaining said cage-like enclosure at a predetermined distance above the floor of said mine, said latter mentioned means being adapted to release said cage-like enclosure for sliding displacement to the floor of said mine in response to an overhead fall causing a predetermined force on the top of said cage-like enclosure.

4,065,168
TRAILER VAN CONSTRUCTION

Richard G. Gregg, Kewanee, Ill., assignor to Pines Trailer Corporation, Chicago, Ill.

Filed June 12, 1972, Ser. No. 261,610
Int. Cl.[2] B62D *33/04*
U.S. Cl. 296—28 M 6 Claims

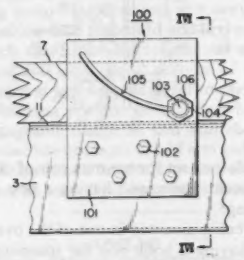


1. An elongate framing structure for use in the construction of a side wall of a trailer van, said framing structure comprising, an elongate rail having a top edge and a depending plate portion and laterally extending means for supporting a roof of the trailer van, said plate portion having a substantially unobstructed flat surface, an elongate capping member having a covering portion adapted to extend over and cover the upper edge of a panel part of said side wall, the capping member including flange means for attachment to said plate portion, and fastening means for securing the capping member with an upper margin of said panel part retained thereon to the flat surface of the plate such that the covering portion and the upper edge of the panel extends at an angle with respect to the top edge of the rail.

4,065,169
MOTOR TRUCK

Akira Yamanaka, Yokohama, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 503,398, Sept. 5, 1974, abandoned. This application July 28, 1976, Ser. No. 709,312
Int. Cl.[2] B62D *33/00*
U.S. Cl. 296—35 R 3 Claims



1. A motor truck comprising a frame device, a body device movable relative to the frame device, bolt members extending vertically at opposite sides of said frame and body devices to hold said devices together, and an energy transforming means comprising a plate member fixed to one of said devices and formed with an elongated slot inclined forwardly and upwardly and with a bore at a lower end of said slot, the diameter of said bore being greater than the width of said slot, and a

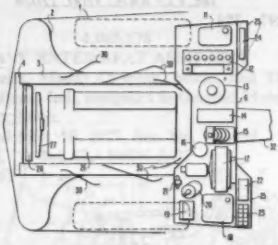
cylindrical member fixed to the other of said devices and passing through said bore whereby said body device can be moved upwardly by said energy transforming means when a longitudinal impacting force of or greater than a predetermined value is applied and said slot and cylindrical member are moved relative to each other to cause deformation of said slot and said plate member.

4,065,170

FRONT SECTION OF A MOTOR VEHICLE, ESPECIALLY OF A PASSENGER MOTOR VEHICLE

Frank-Dietrich Fabian, Rommelshausen, and Rainer Leucht, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Sept. 11, 1975, Ser. No. 612,353
Claims priority, application Germany, Sept. 12, 1974, 2443636
Int. Cl.[2] B60R *11/00*
U.S. Cl. 296—37.1 **30 Claims**



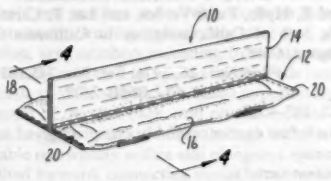
1. In a front section of a motor vehicle having an engine compartment defined by a pivotal hood, by longitudinal bearer members and wheel casings at the sides of the vehicle, and by the end wall of the passenger space, the improvement comprising means for enclosing operational components of said vehicle within said engine compartment separately from the engine, and sealing profile means for sealing said means for separately enclosing said operational components of said vehicle, such that said means for separately enclosing said operational components of said vehicle protects said operational components from environmental conditions both inside and outside said engine compartment.

4,065,171

GLARE SHIELD FOR AUTOMOBILES

Frank Nagy, 8400 Seymour Road, Gaines, Mich. 48436

Filed Feb. 6, 1976, Ser. No. 655,683
Int. Cl.[2] B60J *3/00*
U.S. Cl. 296—97 E **6 Claims**



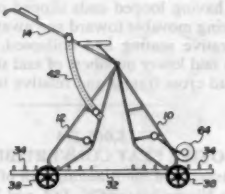
1. A glare shield for use with automobiles or the like comprising; a base member having walls of flexible cloth-like material forming a closed compartment, ballast means in the form of separate particles loosely contained in said compartment, and a flexible shield member formed of the same cloth-like material as said base member and being less flexible than said walls of said compartments, said shield member being joined to said base member for deflection to various selected angular positions relative to said base member for any given position of said base member.

4,065,172

ADJUSTABLE DECK CHAIR

Louis S. Gawlinski, 1550 Bervy St., San Diego, Calif. 92110

Filed May 20, 1976, Ser. No. 688,397
Int. Cl.[2] A47C *4/00*
U.S. Cl. 297—19 **2 Claims**



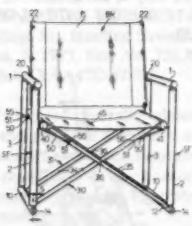
1. An adjustable deck chair comprising;
a. an upper platform and a lower platform hinged together to define an elongated deck portion of a chair;
b. a ground support member pivoted to one of said platforms to support same above a generally horizontal surface;
c. a rigid support brace structure connected to and between said upper platform and said ground support; and
d. means connecting said lower platform and ground support together such that upon receiving the weight of a person tension is applied to said connecting means, and said platforms, connecting means, ground support, and brace structure are maintained rigid;
e. said connecting means comprising an elongated member extendable on a horizontal surface and having means to releasibly engage at a plurality of different positions thereon both said lower platform and said ground support to prevent the separation thereof;
f. said elongated member being rigid and provided with wheels such that said chair is easily mobile when said ground support and lower platform are engaged on said elongated member.

4,065,173

FOLDING CHAIR

Robert S. Gittings, Tiburon, Calif., assignor to Gold Medal, Inc., Racine, Wis.

Filed Oct. 28, 1975, Ser. No. 626,284
Int. Cl.[2] A47C *4/28*
U.S. Cl. 297—45 **16 Claims**



1. A folding chair comprising, a pair of parallel side frames, each side frame comprising, a front leg and rear leg, an arm member rigidly secured between said front and rear legs, and a lower, floor engaging, generally horizontal member, a pivotal connection between said lower member and each of said legs of said side frame, said chair also having a pair of intermediate frames, said intermediate frames each comprising a pair of

cross members for opening and closing in scissors fashion, said intermediate frames being spaced apart in a front and rear direction in respect to said chair and having their lower ends rigidly secured to the respective generally horizontal members of said side frames, said cross members each having upper ends, a seat rail for each pair of said upper ends of said cross members which are located at opposite sides of said chair, said rails having holes for the reception of said upper ends of said cross members, and screws between said upper ends of said cross members and rails, whereby said rails are removably but rigidly secured between said upper ends of said cross members, a flexible seat member mounted between said seat rails, said seat member having looped ends slipped over said rails, said side frames being movable toward and away from one another between operative seating and collapsed, storage positions, during which said lower members of said side frames oscillate along with said cross frames and relative to said legs.

4,065,174

AUTOMOTIVE SEAT CONVERTIBLE TO A BED

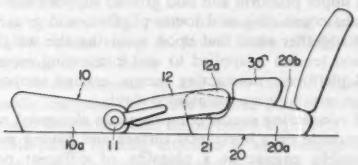
Masao Yokohama, and Shoji Sakai, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd. and Ikeda Bussan Company, Limited, both of Yokohama, Japan

Filed Sept. 28, 1976, Ser. No. 727,612

Claims priority, application Japan, Sept. 30, 1975, 50-132903[U]

Int. Cl.² A47C *1/02*

U.S. Cl. 297—66 **7 Claims**



1. A convertible seat for an automotive vehicle, comprising a front seat with a seat cushion and a tiltable backrest, a rear seat with a seat cushion spaced from the front seat by a predetermined distance, a forward part of the rear seat cushion being cut away to form an upwardly and forwardly opening recess, and a foldable cushion snugly received within the recess of the rear seat cushion and partially connected to the rear seat cushion, the foldable cushion being foldable to be laid upon the rear seat cushion.

4,065,175

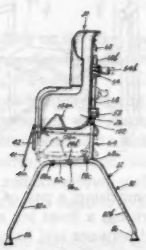
CONVERTIBLE CHAIR

Giuseppe Perego, Piazza Martiri Liberta 6, 20043 Arcore, Italy

Filed July 6, 1976, Ser. No. 703,055

Int. Cl.² A47C *13/00*

U.S. Cl. 297—130 **9 Claims**



1. A convertible chair comprising:

a framework comprising a plurality of elongate legs connected at their upper ends and disposed in outwardly angled configuration in relation to one another, the lower ends of said legs being engageable with a supporting surface;

a chair mounted in pivotable relation to said framework and swingable to a first upright position for occupant seating support relative said framework and to a second inverted position between two of said legs whereby said chair is disposed substantially between said legs;

releasable means for releasably securing said chair to said framework in said first position; and

adjusting means for vertically adjusting said chair relative said framework when said chair is in said first position.

4,065,176

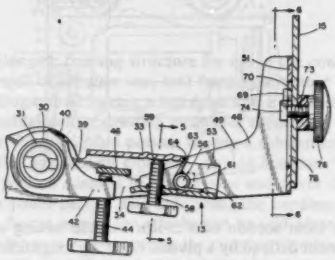
CHAIR CONTROL

Frank J. Fontana, Stratford, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Aug. 19, 1976, Ser. No. 715,910

Int. Cl.² A47C *3/00, 1/024*

U.S. Cl. 297—304 **4 Claims**



1. A chair control for supporting a seat and a back rest, comprising; a seat frame, a back member projecting rearwardly from said seat frame, said back member having a generally vertial wall, an elongated aperture in said wall, a back rest support extending upwardly from said back member for supporting a back rest at the upper end thereof, said back rest support having a T-shaped projection extending, the top of the "T" having a length greater than the width of the elongated aperture in said back member so that the projection may be inserted in said aperture and the back rest support rotated 90° holding the back rest support on said back member, and fastening means for holding said back rest support to said back member.

4,065,177

INFANT CARRIER ASSEMBLY

Richard E. Hyde, Palos Verdes, and Lee T. Carmichael, Pasadena, both of Calif., assignors to California Strolee, Inc., Compton, Calif.

Filed Nov. 26, 1976, Ser. No. 745,183

Int. Cl.² B62B *7/08*

U.S. Cl. 297—327 **8 Claims**

1. An infant carrier assembly comprising:

a frame;

an infant carier;

first and second sets of pins extending from one of said frame and said carrier;

first and second brackets, each having channel means therein, mounted on the other of said frame and said carrier, said first bracket being positioned to receive one of said first and said second sets of pins in the channel means therein and said second bracket being positioned to receive the other of said first and said second sets of pins in the channel means therein;

each said channel means having a first path for receipt of one pin of said first and said second sets of pins and a second path for receipt of a second pin of the same set of said first

and said second sets of pins, said first path being arcuate and said second path being substantially linear and extending toward and away from said arcuate path.

4,065,178

EASY ENTER SEAT ASSEMBLY

Richard F. Carella, Mount Clemens, Mich., and Thomas W. Perry, South Bend, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 18, 1977, Ser. No. 779,085
Int. Cl.² B60N *1/02*
U.S. Cl. 297—341 **3 Claims**

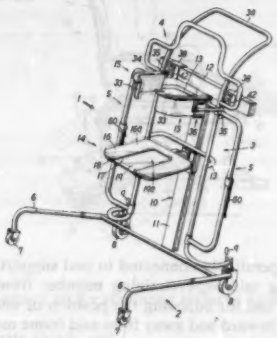
1. A vehicle seat including a cushion and a seat back, track means including spaced rail members attached to said seat cushion and corresponding rail members attached to the vehicle floor slidingly engageable together for movement of said seat cushion in a fore and aft direction with respect to the vehicle, said stationary rails being attached to the vehicle floor and having a vertical wall with elongated slots therein extending in a fore and aft and generally horizontal direction, seat locater means extending between said stationary rails with end portions within said elongated slots and provision for selectively fixing said end portions at desirable locations along said elongated slots corresponding to a desired fore and aft seat cushion position, arm members extending from said seat back and being pivotally mounted to said stationary rails rearward of said end portions of the seat locater means to permit forward tilting movement of the seat back, said pivotal mounts of the seat back arms having an axis extending through said elongated slots and slidable rearwardly within said elongated slots as said seat back is tilted forward, connecting means between said seat back arms and said seat cushion to produce forward movement of the cushion as the arms are pivoted in response to forward tilting of the seat back, said connecting means limiting the degree of forward tilt and sliding movement of the cushion to a constant forward location irrespective of the position of said seat locater means, stop means extending from said slidable seat cushion and attached rail forwardly of the seat locater means and engageable therewith upon rearward return movement of the seat cushion to relocate said cushion in its preselected position along said stationary rails when the seat back is returned to its drive position.

4,065,179

NURSING CARRIAGE

Takao Takasaki, No. 4920-2, Ooazahirano, Nichinan, Miyazaki, Japan

Filed Nov. 22, 1976, Ser. No. 743,599
Claims priority, application Japan, Nov. 27, 1975, 50-124737
Int. Cl.² A61G *1/02*
U.S. Cl. 297—384 **11 Claims**



1. A nursing carriage comprising in combination:
a base frame having a pair of substantially parallel extending feet, each with a caster at the toe and heel ends thereof;
a body frame having a substantially rectangular shape and erected on said base frame in a slightly reclined position;
a T-shaped support securely mounted on said body frame and having a vertical column and a transverse beam;
a seat swingably mounted on said vertical column of said T-shaped support;
a pair of embracing arms swingably mounted on said transverse beam of said T-shaped support;
an arm operating mechanism having means for locking said embracing arms in embracing positions and means for displacing said embracing arms toward each other upon application of a weight thereon;
a top frame mounted securely on said body frame at a position above said embracing arms;
side frames attached at opposite sides of said body frame; and
auxiliary legs swingably mounted on said said frames.

4,065,180

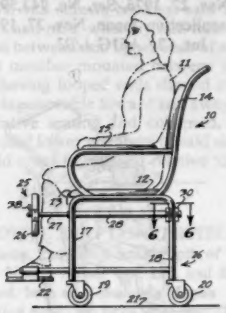
LEG-RESTRAINING DEVICE FOR GERIATRIC CHAIR

John Karay, 1408 College St., Bowling Green, Ky. 42101

Filed Jan. 5, 1977, Ser. No. 756,955
Int. Cl.² A47C *31/00*
U.S. Cl. 297—384 **5 Claims**

1. In a chair including a generally planar seat member having a front edge and opposite sides, and a frame member supporting the seat member above and substantially parallel to a floor surface, a leg-restraining device comprising:
a. an elongated, generally planar, leg-restraining member having opposite end portions,
b. two elongated support members, each support member being attached to one of the opposite end portions of said leg-restraining member,
c. means mounting each of said support members to the frame member on opposite sides of said seat member to dispose the plane of said restraining member normal to the plane of said seat member, and spaced in front of, slightly below, and parallel to the front edge of said seat member,

d. said leg-restraining member being normally spaced proximate to and in front of the shins of the person seated upon the seat member of the chair with his legs depending over the front edge of the seat member, said leg-restraining member being positioned to block the movement of the shins of a person sliding forwardly from his seat-supported position on said seat member, and



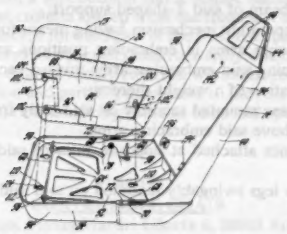
e. means operatively connected to said support member for removing said leg-restraining member from said frame member and for adjusting the position of said restraining member toward and away from said frame member below said seat member.

4,065,181

CUSHION RETENTION FOR A VEHICLE SEAT

Donald E. Gunlock, Birmingham, and John A. Manetta, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1976, Ser. No. 718,882
Int. Cl.² A47C 7/02
U.S. Cl. 297—452 **6 Claims**



6. In a seat, the combination comprising:

a cushion bun of resilient foam having an underface and an edge wall;

a support member having a generally planar support wall adapted for supporting engagement by the underface of the cushion bun and having sidewalls extending generally perpendicularly from the support wall adjacent the edge wall of the cushion bun to support the edge wall of the cushion bun;

a seat cover for enveloping the cushion bun and having an opening in the underside thereof overlying the support wall of the support member and having a size sufficient to permit insertion of the cushion bun only when the cushion bun is compressed, the cushion bun being in a somewhat compressed state when installed within the seat cover so that the seat cover and cushion bun exert opposing forces on one another;

rigid panel means secured to the underface of the cushion bun along only a portion thereof not interfering with compression of the cushion bun sufficient to permit insertion of the cushion bun into the seat cover;

attachment means acting between the seat cover and the rigid panel means to attach the seat cover to the cushion bun;

and fastening means acting between the support member and the rigid panel means to mount the cushion bun on the support member;

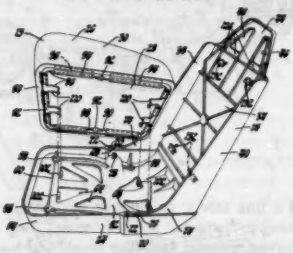
the rigid panel means having an outer edge being generally coextensive with the edge wall of the cushion bun to provide rigidity and prevent the opposing forces imposed by the seat cover and cushion bun from altering the shape of the cushion bun by compressing of the cushion bun at the juncture between the underface and edge wall.

4,065,182

CUSHION RETENTION FOR A VEHICLE SEAT

Michael J. Braniff, Troy, and James L. Waller, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1976, Ser. No. 718,881
Int. Cl.² A47C 7/02
U.S. Cl. 297—452 **3 Claims**



1. A vehicle seat comprising:

a support member having a generally planar support wall;

a seat cushion for mounting on the support member in engagement with the support wall of the support member, said seat cushion having a cushion bun of resilient foam for comfortably seating an occupant on the support member and a seat cover enveloping the cushion bun, the seat cover having an edge portion and an opening adjacent the edge portion through which the cushion bun may be inserted by compressing the cushion bun and then allowing expansion of the cushion bun to fill the seat cover;

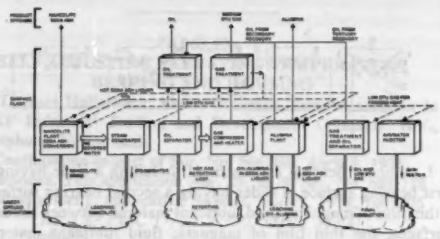
a resilient retainer wire extending around the opening and being attached along the edge portion of the seat cover so that the resilience of the foam bun urges the seat cover outwardly in the direction enlarging the opening and exerting tension on the retainer wire;

a plurality of abutment means on the support member and a plurality of cooperable abutment means formed integrally in the retainer wire, the respective abutment means being matingly engageable upon flexure of the retainer wire in the direction which decreases the size of the opening of the seat cover and opposes the tensioning effort exerted on the border wire by the resilience of the cushion bun acting on the seat cover whereby the resilience of the cushion bun cooperates with the resilience of the retainer wire to maintain the integrally formed abutment means on the retainer wire in engagement with the mating abutment means on the support member to attach the seat cushion on the support member.

4,065,183
RECOVERY SYSTEM FOR OIL SHALE DEPOSITS

David A. Hill, Hermosa Beach; Durk J. Pearson, Palos Verdes Estates; Ethelyn P. Motley, Rancho Palos Verdes, all of Calif.; Thomas N. Beard, Denver, Colo., and James L. Farrell, Palos Verdes Estates, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Nov. 15, 1976, Ser. No. 741,817
Int. Cl.[2] E21C *41/10*
U.S. Cl. 299—4 16 Claims



1. A process for the in-situ recovery of hydrocarbon values and associated minerals from subsurface oil shale deposits in which a gas-tight retort chamber can be produced comprising the steps of:

A. drilling into said oil shale deposits;

B. injecting heated water into said shale deposits to dissolve and extract said associated minerals which are water soluble thereby forming a substantially gas-tight chamber;

C. injecting hot, pressurized gas into said shale deposit in said chamber whereby said associated minerals are decomposed and hydrocarbon fluids extracted;

D. injecting a solvent-surfactant into said deposit and extracting said decomposed minerals and hydrocarbon fluids;

E. removing said solvent-surfactant from said deposit;

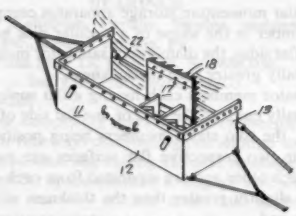
F. instituting a flame front to combust hydrocarbon and carbonaceous residue; and

G. filling said chamber with a fluid selected from the group consisting of water, aqueous solutions, and aqueous slurries.

4,065,184
PLOW CUTTER ASSEMBLY

John M. Tipper, Tams, W. Va. 25933

Filed Oct. 27, 1976, Ser. No. 736,149
Int. Cl.[2] E21C *35/20*
U.S. Cl. 299—34 9 Claims

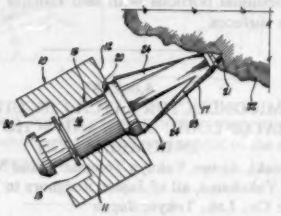


1. An apparatus to be pulled in a direction of travel for scraping and conveying coal from a mining site to a point remote therefrom comprising, at least one hollow rectanguloid container having two open faces which are substantially parallel to the direction of travel of the container, and two closed faces also parallel to the direction of travel and disposed orthogonally to each other, and two end walls perpendicular to the direction of travel and connected to said closed faces provided with means for pulling said container along the face of a coal deposit, and means disposed on one of said closed faces within said container for attaching scraping means thereto so that said scraping means extends out from at least one of said open faces to provide a cutting surface.

4,065,185
POINT-ATTACK BIT

Gerald W. Elders, 38 Yakashba Estates, Prescott, Ariz. 86301

Filed July 22, 1976, Ser. No. 707,647
Int. Cl.[2] E21C *35/18*
U.S. Cl. 299—86 7 Claims



1. A point-attack bit for removing material from a mine face, comprising:

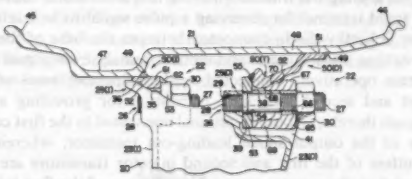
a. an elongate shank, and

b. a head integral and coaxial with the shank, the head including a plurality of peripherally spaced, laterally projecting vanes extending generally longitudinally of the bit, each vane being substantially triangular with a narrow leading end and a wider trailing end, and having relatively diverging sides that extend from the leading end to the trailing end, and contact with material being mined to effect a positive turning of the bit upon picking of the mine face.

4,065,186
DUAL FLANGED WIDE BASE TIRE CARRYING RIM AND WHEEL

William D. Walther, Kettering, Ohio, assignor to Dayton-Walther Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 592,501, July 9, 1975, abandoned, and Ser. No. 592,502, July 9, 1975, abandoned. This application Jan. 11, 1977, Ser. No. 758,451
Int. Cl.[2] B60B *23/10*
U.S. Cl. 301—12 R 4 Claims



1. A combination of a tire carrying rim mounted by fastening assemblies on a vehicle wheel,

said wheel having two series of alternating spoke members, each of said series having an axially spaced-apart and staggered relation to the other of said series, each of said spoke members having a felloe comprising a radially directed surface substantially perpendicular to the rotational axis of said wheel and providing a mounting location for an axially projecting component of said fastening assemblies,

said rim having bead flanges projecting radially outwardly from a rim base comprising a well portion and a lateral

portion between said bead flanges, said rim having two axially spaced-apart radially inwardly projecting mounting flanges, one of said mounting flanges being integrally attached to said rim base well portion and the other of said mounting flanges being integrally attached to said rim base lateral portion, each of said mounting flanges having a radially directed terminal portion substantially perpendicular to the rotational axis of said rim and having a series of bores therein for receiving an axially projecting component of said fastening assemblies,

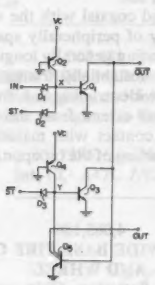
whereby, said rim is mounted on said wheel by tightening of said fastening assemblies against each said mounting flange terminal portion and the full surface engagement of said terminal portions with said radially directed wheel felloe surfaces.

4,065,187

SEMICONDUCTOR LATCH CIRCUIT USING INTEGRATED LOGIC UNITS AND SCHOTTKY DIODE IN COMBINATION

Yasoji Suzuki, Ayase; Yukuya Tokumaru, and Masanori Nakai, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1976, Ser. No. 746,159
Claims priority, application Japan, Dec. 1, 1975, 50-142180
Int. Cl.² H03K *3/286*
U.S. Cl. 307—279 **14 Claims**



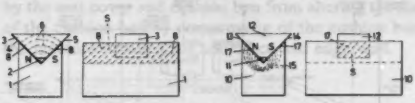
1. A semiconductor latch circuit operative with a power source comprising a first integrated injection logic unit formed of a first switching transistor and a first injector transistor; a second integrated injection logic unit formed of a second switching transistor and a second injector transistor; an output signal leading-out transistor having first and second collectors; an input terminal for receiving a pulse signal to be latched; a first Schottky diode connected between the base of the first switching transistor and said input terminal; strobe signal input means operatively connected to the respective bases of said first and second switching transistors for providing strobe signals thereto; an output terminal connected to the first collector of the output signal leading-out transistor; wherein the emitters of the first and second injector transistors are connected to the power source; the collector of the first injector transistor and the collector of the second injector transistor are connected to the bases of the first and second switching transistors, respectively; the bases of the first and second injector transistors are connected to a reference potential; the collectors of the first and second switching transistors are connected to the base of the output signa leading-out transistor; the emitters of the first and second switching transistors are connected to the reference potential; the second collector of the output signal leading-out transistor is connected to the base of the second switching transistor; and said first Schottky diode is rendered nonconductive when a pulse signal supplied to the pulse signal input terminal has a level of "1".

4,065,188

LINEAR BEARING FOR PARALLEL TRACKING ARM

Keith Douglas Ridler, Fulbourn; Alexander Bennett Gosling, Linton, and Gordon Malcolm Edge, Saffron Walden, all of England, assignors to Strathearn Audio Limited, Great Britain

Continuation of Ser. No. 548,602, Feb. 10, 1975, abandoned.
This application July 14, 1976, Ser. No. 705,026
Int. Cl.² F16C *39/06, 32/04*
U.S. Cl. 308—10 **6 Claims**



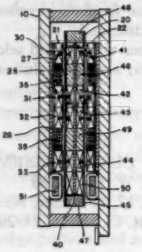
1. A linear bearing arrangement including a slide having a first bearing surface, a slider having a second bearing surface, a thin film of magnetic fluid lubricant material between the said surfaces, the thin film of magnetic fluid lubricant material adhering to one of the said bearing surfaces under the influence of a magnetic field and means to provide a magnetic field extending from one of the said bearing surfaces to the magnetic fluid lubricating material to maintain the said material on said one surface.

4,065,189

MAGNETICALLY SUSPENDED ANGULAR MOMENTUM WHEEL

Daniel J. Sikorra, Belleair, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 14, 1975, Ser. No. 622,324
Int. Cl.² F16C *39/00*
U.S. Cl. 308—10 **6 Claims**



1. An angular momentum storage apparatus comprising:

a rotor member in the shape of a circular disk having two parallel flat sides, the diameter of said rotor member being substantially greater than its thickness;

a pair of stator members each having a flat surface of area substantially equal to the area of one flat side of said rotor member, the two stator members being positioned such that their two respective flat surfaces are parallel and facing each other and are separated from each other by a distance slightly greater than the thickness of said rotor member; and

means for supporting said rotor member between said stator members free of mechanical contact with said stator members and free for rotation about a spin axis said means for supporting including,

a plurality of single polarity axially magnetized permanent magnet rings mounted on the flat sides of said rotor member and the flat surfaces of said stator members,

electromagnetic field generating means mounted on said stator members for generating a differential magnetic

field between said stator members and said rotor member,

position sensing means for detecting the displacement of said rotor from a predetermined position with respect to said stator members and for generating a signal which is a function of said rotor member displacement, and

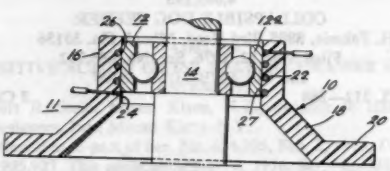
means for receiving the signal from said position sensing means and connected to said electromagnetic field generating means to control said magnetic field so as to maintain said rotor member in said predetermined position.

4,065,190

SELF ADJUSTING ELEVATING TEMPERATURE BEARING AND HOUSING

Stig Lennart Hallerback, Vastra Frolunda, Sweden, assignor to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Continuation-in-part of Ser. No. 566,080, April 8, 1975, abandoned. This application Apr. 29, 1976, Ser. No. 681,718
Claims priority, application Sweden, May 3, 1974, 7405905
Int. Cl.² F16C *17/22, 27/00, 35/00, 39/00*
U.S. Cl. 308—15 **9 Claims**



1. A bearing housing which is subjected to varying temperatures for mounting an annular bearing element including a section having a generally cylindrical surface defining a seat of a predetermined diametral dimension in relation to the annular bearing element to firmly support the same and formed of a molding material having a first longitudinal expansion coefficient and a spiral cast in the molding material having at least a portion thereof confronting the annular bearing element when mounted in the seat, said spiral being of a material having a second longitudinal expansion coefficient the same as the annular bearing element and different from said molding material, said section of the bearing housing with the spiral cast therein providing a seat having substantially the same heat expansion coefficient as the annular bearing member.

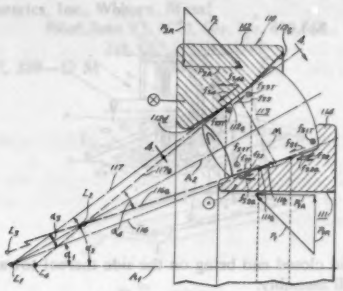
4,065,191

ROLLER SKEW CONTROL FOR TAPERED ROLLER BEARINGS

Erik Magnus Kellstrom, Partille, Sweden, assignor to SKF Industries, Inc., King of Prussia, Pa.

Filed May 13, 1976, Ser. No. 686,030
Int. Cl.² F16C *19/00, 33/00*
U.S. Cl. 308—202 **16 Claims**

1. A bearing comprising inner and outer members having inner and outer raceways confronting one another to define an annular space, at least one rolling element rotatable about an axis in said annular space adapted to engage said members at inner and outer raceway contact zones and mounting said members for rotation relative to one another in a path about a bearing axis, said rolling element having a profile tapered at a predetermined angle with respect to its rotational axis, the apex of the taper angle of the rolling element being spaced from said bearing axis when the bearing is under a predetermined external load and surface means on at least one of said raceways to cause said rolling element at a predetermined position in the load zone to assume a non-negative skew angle within a predetermined angular range, said rolling element having a skew angle when the rolling element axis and bearing axis are not coplanar and said skew angle being positive when the axial friction force component on a raceway arising between said



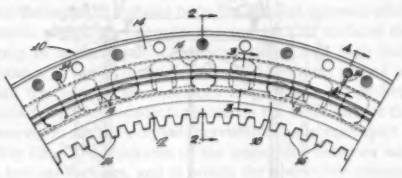
rolling element and said raceway in said contact zone is so directed that it counteracts the axial component of the external load on said one raceway.

4,065,192

RACE INSERT FOR BEARING

John E. Sague, Philadelphia, Pa., assignor to Messinger Bearings, Inc., Philadelphia, Pa.

Filed July 19, 1976, Ser. No. 706,756
Int. Cl.² F16C *33/58*
U.S. Cl. 308—215 **6 Claims**



1. A ring for a bearing assembly having generally parallel inner and outer faces, means defining a pocket in the surface between said faces for an insert having a load carrying surface defining a raceway, said pocket including a circumferentially extending first wall generally parallel to said faces and spaced therebetween, a second circumferentially extending frusto-conical wall which diverges inwardly from one face toward said first wall, an endless annular insert adapted to seat in said pocket having a frusto-conical surface portion confronting and complementing said second wall portion and dimensioned to provide an interference fit therewith.

4,065,193

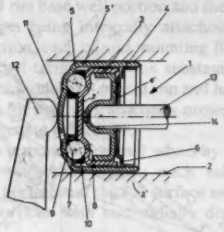
THRUST BALL BEARING

Horst Manfred Ernst, Eltingshausen; Armin Olschewski, Schweinfurt; Rainer Schurger, Schwanfeld; Lothar Walter, Schweinfurt; Manfred Brandenstein, Aschfeld; Erich Burkl, Stammheim, and Heinz Kiener, Waigolshausen, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

Filed June 7, 1976, Ser. No. 693,510
Claims priority, application Germany, July 9, 1975, 7521786
Int. Cl.² F16D *23/00*
U.S. Cl. 308—233 **11 Claims**

1. In a thrust bearing having thin-walled inner and outer rings, at least one of which has a closed end, and a rolling ball

assembly between said rings; the improvement wherein said closed end is cup-shaped and curved, with the center of curvature of said closed end being on the side thereof toward said rolling ball assembly.

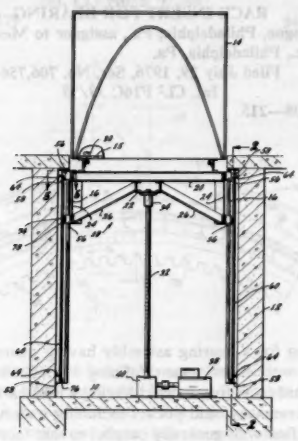


4,065,194

PULPIT ELEVATING AND LOWERING SYSTEM

Armand D. Mattia, 4058 Apore St., La Mesa, Calif. 92041

Filed May 20, 1976, Ser. No. 688,177
Int. Cl.[2] A47B *51/00*
U.S. Cl. 312—247 3 Claims



1. A system for moving a pulpit between an elevated position at a selected elevation for use and a lowered stored position which comprises:

a walled pit adapted to be located immediately beneath a floor;

a plurality of upstanding parallel guide rails located adjacent to vertical walls of said pit;

a plurality of pillow blocks slidably engaging said guide rails;

a carriage mounted on said pillow blocks and spanning the space between said guide rails;

a drive nut secured to said carriage at substantially the center thereof;

a drive screw engaging said drive nut, said drive screw extending upwardly from the bottom of said pit substantially parallel to said guide rails;

drive means within said pit adapted to rotate said screw selectively in either direction;

a pulpit releasably mounted on the top of said carriage for vertical movement therewith;

separate hinged lid means spring loaded toward closing said pit when said carriage and pulpit are entirely within said pit;

guide means on the upper surface of said pulpit to engage said lid means about the lid hinge as said pulpit is moved upwardly;

a hinged extension on the upper surface of said pulpit adapted to engage said hinged lid as said pulpit is lowered so that said extension is pivoted about a hinge to a stored position behind said guide means whereby further lowering of said pulpit is unobstructed;

control means to selectively operate said screw drive in a direction which elevates said pulpit to a selected height and opens said lid means and in a direction which lowers said pulpit into said pit and allows said lid to close, providing an unobstructed floor surface; and

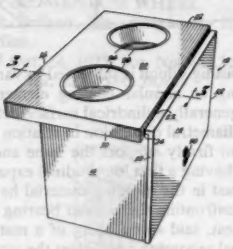
stop means comprising a finger extending from said carriage toward an adjacent wall of said pit, an upper limit switch secured to said adjacent wall positioned to be engaged by said finger when said carriage is at the maximum elevated position, a lower limit switch secured to said adjacent wall positioned to be engaged by said finger when said carriage is at the maximum lowered position, and electric circuit means interconnecting said upper and lower limit switches said control means and said screw drive motor whereby said drive motor is stopped whenever one of said upper and lower limit switches is engaged by said finger.

4,065,195

COLLAPSIBLE DOG FEEDER

John H. Fahmie, 8805 Bird Road, Miami, Fla. 33156

Filed May 12, 1976, Ser. No. 685,702
Int. Cl.[2] A47B *43/00, 48/00*
U.S. Cl. 312—258 3 Claims



1. A portable animal feeder stand comprising:

a front panel of rigid material having opposed side edges and an upper edge and a lower edge and having an inner face and an outer face extending between the edges,

a pair of side panels of rigid material and of similar size to one another, each having opposed side edges and a top edge and a bottom edge,

hinge means connecting one edge of one of said pair of panels to the inner face of the front panel and hinge means connecting the other of said pair of panels to the inner face of the front panel, each of said hinge means being adjacent and parallel to one of the side edges of said front panel, and the bottom edge of each side panels being at the plane of the bottom edge of said front panel and the top edge of each of said side panels being spaced from the top edge of said front panel on said inner face, a common distance with their top edges defining a support surface,

the distance between the side edges of each panel being not greater than one-half the distance between the side edges of the front panel for overlaying the front panel when collapsed,

the top edge of said front panel having a lip extending from the inner face of a predetermined dimension, and

a top panel having an inner surface an an outer surface, a front edge, a rear edge and side edges and said side edges being spaced from one another a distance slightly greater than the distance between the side edge of said front panel and the distance between said front and rear edge of said

top panel being spaced from one another a distance greater than the distance between the top and bottom edges of said side panel,

hinge means connecting the front edge of the top panel to the front panel, and

means to connect the panels together when the side panels are hingedly moved into a common plane parallel to the plane of the front panel and the top panel is moved into a plane parallel to said side panels and front panel, said recessed are provided in the top panel sized to receive feeding parts, said top panel includes flanges extending from the inner surface on the side and rear edges defining a threesided skirt and said front panel having a flange along the top edge extending away from said inner face, said flanges defining a receptacle for said side panels when said panels are hingedly moved into coplanar relation overlaying said inner face of said front panel and said top panel is hingedly moved into parallel alignment with said front panel.

4,065,196

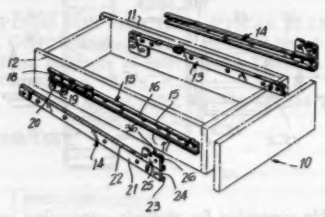
POSITIVE ACTION FRONT RELEASE DRAWER SLIDE ASSEMBLY

Robert R. Stein, Mount Kisco, N.Y., assignor to Hardware Designers, Inc., Mount Kisco, N.Y.

Continuation-in-part of Ser. No. 654,238, Feb. 2, 1976, Pat. No. 3,995,927. This application Nov. 3, 1976, Ser. No. 738,586

Int. Cl.[2] A47B *88/16*; F16C *21/00*

U.S. Cl. 312—333 **8 Claims**



1. A front removable drawer slide assembly comprising, in combination, a drawer channel and a cabinet channel, said channels being elongate and generally U-shaped in transverse section, said channels each including a central web defining the branch of said U and a pair of spaced parallel track portions extending from the extremities of said branch and defining the legs of said U, said channels being disposed in vertically stacked parallel relation, with said webs being in lateral offset vertical planes and said branches extending in opposite directions, with the lower branch of the upper channel being in proximate spaced relation to the upper branch of the lower channel, an anti-friction roller mounted adjacent an extremity of each said channel, said rollers extending into the other said channels for slidably supporting said channels for translatory movement, a latch member movably mounted on one said channel, said latch member being shiftable between locking and unlocking positions, a stop member on the other said channel positioned to engage said latch member in the locking position thereof and limit separating movements of said channels, said latch member, in the unlocking position thereof, being disposed in the path of said roller of said other channel and being shifted to said locking position responsive to engagement with said roller.

4,065,197

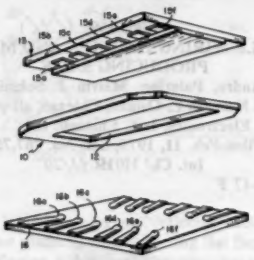
ISOLATED PATHS CONNECTOR

Charles H. Kuist, Mendham, N.J.; Vincent Squitieri, Billerica, and Richard E. Seeger, Topsfield, both of Mass., assignors to Chomerics, Inc., Woburn, Mass.

Filed June 17, 1974, Ser. No. 479,668

Int. Cl.[2] H01R *13/48*

U.S. Cl. 339—17 M **2 Claims**



1. An electrical one piece connector in the form of a sheet having a thickness of between 1 to 100 mils and having top and bottom surfaces and which comprises a homogeneous mixture of a flexible insulator material binder and metal particles, said connector having means for providing at least when uncompressed a low through resistance of less than 1,000 ohms between opposite aligned points on said top and bottom surfaces as well as a high isolation resistance, which is greater than 100,000 ohms, along the top and bottom surfaces between points at a distance apart equal to five times the thickness of the connector between said top and bottom surfaces further characterized in that the connector exhibits said low through resistance through the volume between aligned opposed electrical contacts placed on opposite top and bottom surfaces thereof merely in surface contact therewith and said high isolation resistance between diagonal electrical contacts placed on opposite top and bottom surfaces thereof as well as between adjacent electrical contacts placed on the same surface thereof all merely in surface contact therewith at a distance apart equal to five times the thickness of the connector between said top and bottom surfaces, and in which the connector contain 9 to 18 volume percent of metal particles.

4,065,198

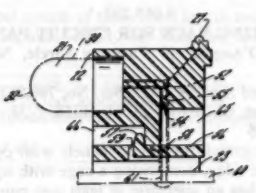
LED MOUNTING RETAINER AND DISPLAY

Thomas W. Jordan, Berkeley, Ill., assignor to Wescom, Inc., Downers Grove, Ill.

Filed Dec. 13, 1976, Ser. No. 749,740

Int. Cl.[2] H05K *1/18*

U.S. Cl. 339—17 D **14 Claims**



1. A retainer for mounting an LED of the type having leads projecting perpendicularly from a base, said retainer comprising a body portion, a locking portion movable with respect to said body portion from an open to a closed position locked to said body portion, seating means on the body portion for seating the LED, a supporting base substantially at right angles to said seating means, apertures through the seating means for

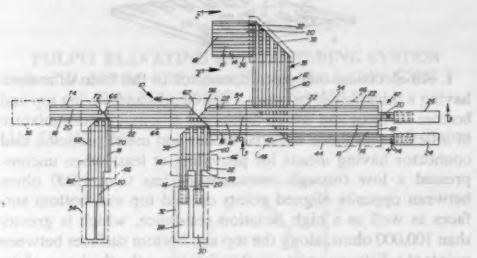
receiving said leads when the LED is seated and allowing said leads to project through said body portion, means on the locking portion for engaging the leads as the locking portion is moved toward said closed position to bend said leads toward said supporting base, said body portion and locking portion mating in said closed position to bend leads at substantially right angles for projection below said supporting base, thereby to form a right angle mount.

4,065,199

FLAT CABLE WIRING HARNESS AND METHOD OF PRODUCING SAME

Michael G. Andre, Palatine; Melvin J. Schmidt, Elk Grove Village, and Kenneth L. Osman, Chicago, all of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Feb. 11, 1977, Ser. No. 767,754
Int. Cl.[2] H01R *11/20*
U.S. Cl. 339—17 F **16 Claims**



1. A cable harness assembly comprising:

a flat ribbon cable having a plurality of longitudinally extending conductors encapsulated in a longitudinally extending insulator for insulating said conductors from each other and from external engagement,

said cable folded at respective positions for extending said conductors in a selected direction to a first termination position at which said insulator is longitudinally slit to form a first projecting conductor extending from a fold edge of said cable,

a folded end on said projecting conductor for extending said conductor in the direction of said cable fold edge,

means establishing an electrical connection to the projecting conductor,

and a plurality of reverse bends in another conductor of said cable extending from said fold edge at the end of said slit and having a length substantially equal to the folded projecting portion of said projecting conductor for extending said one and other conductor in a common cable portion to another position.

4,065,200

MOUNTING RACK FOR CIRCUIT PANELS

Raymond W. D'Angelo, 18 Coventry Circle, North Haven, Conn. 06473

Filed Apr. 19, 1977, Ser. No. 788,803
Int. Cl.[2] H01R *13/62*; H05K *7/18*
U.S. Cl. 339—65 **1 Claim**

1. A mounting rack for circuit panels with oppposite end edges and a side edge, comprising a cage with opposite walls each of which has an aperture; at least one pair of identical opposite guide channels with a common median plane for sliding reception of a circuit panel with its end edges, of which each guide channel is formed by a pair of resilient metal leaves disposed side-by-side and bowed toward each other to leave them with apices intermediate their lengths, with the leaves of each pair being arranged symmetrically about said median plane and being with their ends secured to a cage wall, and the leaves of each pair having at their apices lateral fingers extending into the aperture in the cage wall to which said leaves are secured for limiting separating movement of said leaves; and a connector block mounted in said cage and having a groove in substantial alignment with said median plane, with a circuit

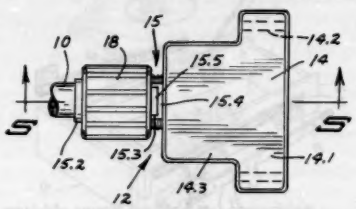
panel in said guide channel being tiltable about the apices of said leaf pairs as a fulcrum and being locked in position therein on sliding the circuit panel with its side edge into register with said groove.

4,065,201

CONNECTOR

Chander M. Wahi, Waseca, Minn., assignor to E. F. Johnson Company, Waseca, Minn.

Filed Nov. 19, 1976, Ser. No. 743,420
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—103 R **7 Claims**



1. A cable connector for securely connecting an electric cable to the housing of an electric device and including an internally threaded nut and an integral body, the body having a rearwardly extending, elongated neck with an internal bore through which may be passed a cable, the neck being externally threaded along at least a portion of its length to receive the threaded nut and the walls of the neck having slots therethrough to provide at least one forwardly-extending ear movable radially inwardly and outwardly of the neck, the ear having a radial thickness at its forward end greater than the thickness of the adjacent walls of the neck, whereby, as the nut is threaded forwardly onto the neck, the at least one ear is cammed inwardly of the bore to firmly grasp a cable.

4,065,202

PROJECTION SYSTEM FOR DISPLAY OF PARALLAX AND PERSPECTIVE

Robert L. Kurtz, Huntsville, Ala., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 6, 1975, Ser. No. 629,458
Int. Cl.[2] G02B *27/00*
U.S. Cl. 350—3.5 **6 Claims**

1. A three-dimensional holographic projection system comprising:

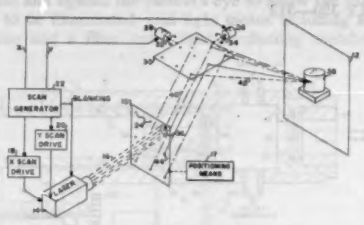
positioning means for positioning a holographic transparency in a position where light may be transmitted through it;

light source means for projecting a beam of monochromatic light along a movable path through a hologram positioned by said positioning means;

scanning and blanking means coupled to said light source means for causing said beam to be selectively and sequentially displaced to selectively strike said hologram at a plurality of selected perspective angles and said light to be blanked except when striking said hologram at said selected perspective angles;

a viewing screen; and

mirror means responsive to resulting displaced beams omitted from the holographic transparency for reflecting said beam in register on said screen.

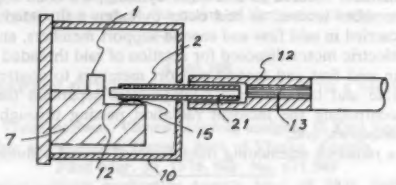


4,065,203

COUPLERS FOR ELECTRO-OPTICAL ELEMENTS

James E. Goell, Roanoke, Va., and H. David Brandt, S. Hamilton, Mass., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 10, 1975, Ser. No. 639,546
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96 C 20 Claims



1. A coupler for connecting between optical fibers and electro-optical elements of the type having a supporting header comprising:

first coupling means for providing optical connection with said electro-optical elements a connector optical fiber within a support tube fixedly attached to the header; and

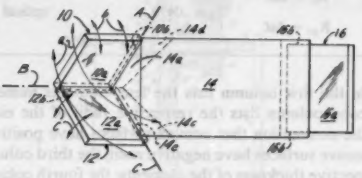
second coupling means for connecting between said optical fibers and said electro-optical elements when said fibers are connected with said second coupling means and said second coupling means are connected with said first coupling means, said second coupling means comprising a dual diameter tube for receiving the support tube at one end and at least one optical fiber at the other end for providing optical continuity between said at least one electro-optical element and said at least one optical fiber.

4,065,204

LATERAL TRANSFER RETROREFLECTORS

Morton S. Lipkins, 3 Nemeth St., Malverne, N.Y. 11565

Continuation-in-part of Ser. No. 475,133, May 31, 1974, Pat. No. 3,936,194. This application Jan. 29, 1976, Ser. No. 653,479
Int. Cl.[2] G02B 5/122
U.S. Cl. 350—102 8 Claims



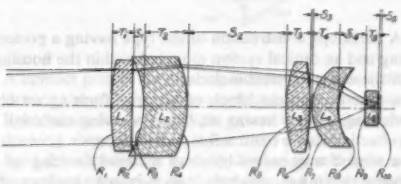
2. A hollow lateral transfer retroreflector, including first and second reflector plates having reflecting flat faces disposed to from a roof reflector, a third reflector plate having a reflecting flat face, and a central member, said third plate being united to a first portion of the central member and being disposed in relation to said roof reflector to constitute therewith a hollow lateral transfer retroreflector, a second portion of said central member spaced from said first portion having a mounting flat face parallel to the reflecting face of said third reflector plate, an edge of said second reflector plate abutting said mounting flat face, an edge of the first reflector plate abutting the reflecting flat face of said second reflector plate, and said mounting face having an edge abutting the reflecting flat face of said first reflector plate, each of said first and second reflector plates and said central member being united where they abut one another.

4,065,205

SHORT FOCAL LENGTH OPTICAL SYSTEM WITH LARGE APERTURE

Andor A. Fleischman, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed July 27, 1976, Ser. No. 709,047
Int. Cl.[2] G02B 9/34, 9/62
U.S. Cl. 350—216 3 Claims



1. An optical system of short focal length and large effective aperture having substantially the following specification:

EFL = 8.26mm (.3253 inches)
Half Angle of Field = 2.58°
(Dimensions in Inches where applicable)

Lens	Radii	Thickness	Spacing	N_D	V
	R_1 = .9100				
L_1		T_1 = .0780		1.805	25.4
	R_2 = 52.8905				
			S_1 = .0410		
	R_3 = −.3670				
L_2		T_2 = .1580		1.494	66.1
	R_4 = .4500				
			S_2 = .3800		
	R_5 = .5000				
L_3		T_3 = .0910		1.494	66.1
	R_6 = .9966				
			S_3 = .0030		
	R_7 = .1780				
L_4		T_4 = .1000		1.805	25.4

-continued

EFL = 8.26mm (.3253 inches)
Half Angle of Field = 2.58°
(Dimensions in Inches where applicable)

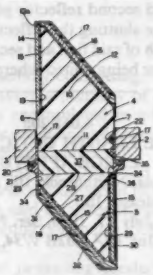
Lens	Radii	Thickness	Spacing	N_D	V
	$R_8 = -.2170$				
			$S_4 = .1000$		
	$R_9 = Inf.$				
L_5		$T_5 = .0433$		optical	
	$R_{10} = Inf.$				material
			$S_5 = .0050$		

wherein the first column lists the lens elements numerically; the second column lists the respective radii of the elements, using the convention that convex surfaces have positive radii and concave surfaces have negative radii; the third column lists the respective thickness of the elements; the fourth column lists the axial spacings between adjacent elements; and the fifth and sixth columns list respectively the dispersion and refractive indices of the optical materials for the lens.

4,065,206
BALLISTIC PROTECTED PERISCOPE CONSTRUCTION

Gerald Tausch, Salem, Ohio, assignor to Miller-Holzwarth, Inc., Salem, Ohio

Filed June 21, 1976, Ser. No. 697,933
Int. Cl.² G02B 5/08
U.S. Cl. 350—301 6 Claims



1. A periscope construction of the type having a protective housing and an optical system mounted within the housing, in which the optical system includes:

a. a first transparent block of material forming an object viewing section having an object viewing surface a first reflective surface and a first end surface;

b. a second transparent block of material forming an eyepiece viewing section having an eyepiece viewing surface, a second reflective surface, and a second end surface;

c. said first and second transparent blocks being mounted at generally opposite ends of the protective housing, with the first and second reflective surfaces and the object and eyepiece viewing surfaces being generally parallel with respect to each other, respectively, and forming a parallelogram in cross section;

d. the first and second end surfaces being spaced from each other and forming a void therebetween, said void being located within the protective housing and generally intermediate the reflective surfaces;

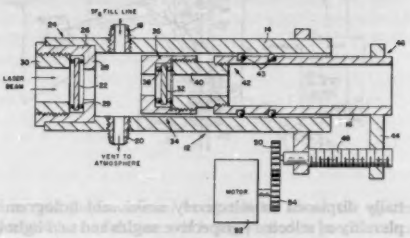
e. shock absorbing means mounted within and filling the void between the first and second end surfaces of the blocks to reduce the transmission of shock waves between said blocks when the first block is struck by a projectile; and

f. said shock absorbing means including a layer of soft and pliable optical adhesive which bonds the blocks together and which remains in a soft, rubbery, heavy gelatin state.

4,065,207
PROGRAMMABLE POWER ATTENUATOR FOR CONTINUOUS CO_2 LASERS

Peter D. Zavitsanos, Norristown; Joseph A. Golden, Pennsburg, and Frederick N. Alyea, King of Prussia, all of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 17, 1976, Ser. No. 724,039
Int. Cl.² G02B 5/24
U.S. Cl. 350—312 2 Claims



1. An optical cell of variable effective axial length comprising:

a. an outer cylindrical cell having a fill and vent opening and a first transparent planar window fixedly secured to one end of said cylindrical cell;

b. an inner cylindrical cell slidably carried in said outer cylindrical cell and having a second transparent planar window member secured therein to form a volume between said windows, said inner cylindrical cell including a first tubular member, a second tubular member having a first end in threaded relation with said first tubular member, a third tubular member having a first end in threaded relation with the second end of said second tubular member, the second end of said third tubular member being flanged with an opening therethrough, said flanged end being in spaced relation with the second end of said second tubular member to form a space therebetween to receive said second window therein;

c. displacing means for moving said inner cylinder within said outer cylinder to vary the distance between said windows, said displacing means including a first support member secured to said inner cylinder, a second support member secured to said outer cylinder, a threaded shaft carried in said first and second support members, and, an electric motor disposed for rotation of said threaded shaft in said first and second support members to control the rate and distance said windows are separated thereby controlling the incident radiation passing through said windows; and,

d. a radiation attenuating fluid disposed in said volume.

4,065,208
OPHTHALMOSCOPE

Thomas A. Currey, 87 Wallace Road, Memphis, Tenn. 38117

Filed Oct. 29, 1974, Ser. No. 518,612
Int. Cl.² A61B 3/12
U.S. Cl. 351—6 3 Claims

1. An ophthalmoscope for allowing an observer to view the retina of a patient's eye during retina surgery, said opthalmoscope comprising:

a. a straight, tubular body member having a first end portion and a second end portion;

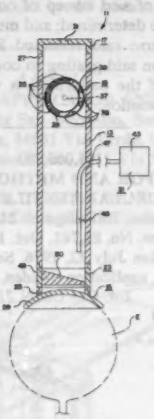
b. objective means attached to said first end portion of said body member for placement over the patient's eye, said objective means including a contact lens member fixedly attached to said first end portion of said body member for contacting engagement with the cornea of the patient's eye;

c. ocular means attached to said second end portion of said

body member for allowing the observer to view the patient's eye through said objective means;

d. magnification means positioned in said body member between said objective means and said ocular means for causing the patient's eye to be magnified as the observer views the patient's eye through said ocular means, said magnification means including a plurality of magnification lens for varying the magnification of the patient's eye;

e. light means for directing light through said objective means and against the patient's eye to allow the patient's eye to be illuminated, said light means including a light source and a fiber optic light-conducting member for



guiding the light from said light source to the patient's eye; and;

f. deflection means positioned in said body member adjacent said objective means for directing the light from said fiber optic light-conducting member and the line of sight from said ocular means into the retina of the patient's eye to allow the observer to clearly view the retina of the patient's eye, said deflection means including means for allowing the angle the light from said fiber optic light-conducting member and the line of sight from said ocular means are being directed into the retina of the patient's eye to be changed thereby allowing the observer to view a particular area of the retina of the patient's eye.

4,065,209

CASSETTE REWIND STOP CONTROL FOR A MOVIE CAMERA

Otto Freudenschuss, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

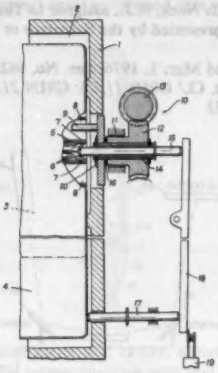
Filed Mar. 29, 1976, Ser. No. 671,549

Claims priority, application Austria, Mar. 28, 1975, 2408/75

Int. Cl.[2] G03B *23/02*

U.S. Cl. 352—72 **4 Claims**

1. A movie camera of the type arranged to accommodate two different types of cassettes having surface portions characteristic of each type, at least one of the cassettes having a releasable rewind stop for at least one of the two film spools in the cassette, comprising, in combination, means for releasing the rewind stop on the one cassette, an actuating member movable between an operative position for actuating said rewind stop releasing means and an inoperative position for deactuating said rewind stop releasing means, a movably mounted scanner operatively associated with said actuating member for engagement by a cassette of a first type inserted into the camera, said scanner being movable into one position by insertion of a cassette of the first type in the camera to move said actuating member into said operative position for actuating said rewind stop releasing means for releasing the cassette rewind stop and into a second position upon insertion of a cassette of the second type into the camera to release said actuating member from said operative position into said inop-



erative position for deactuating said rewind stop releasing means.

4,065,210

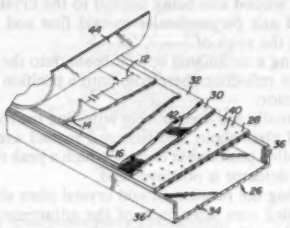
VACUUM CONTACT PRINTER

Ralph N. Milburn, 3702 Chatham Road, Ellicott City, Md. 21043

Filed July 12, 1976, Ser. No. 704,363

Int. Cl.[2] G03B *27/20*

U.S. Cl. 355—91 **19 Claims**



1. A contact printer for printing indicia formed on a translucent drawing sheet on a photo-sensitized sheet, comprising:

a. light means for passing light consecutively through said drawing sheet to said photo-sensitized sheet;

b. light drive means for linearly displacing said light means in a plane parallel to said drawing and photo-sensitized sheets;

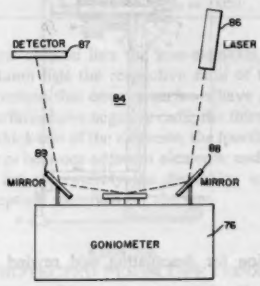
c. vacuum chamber having a vacuum pump for maintaining a pressure drop from an external to an internal environment of said vacuum chamber, said sheets being mounted adjacent an upper wall of said vacuum chamber, said wall having a first plurality of openings passing therethrough; and,

d. sheet mounting means for securing said sheets to said upper wall in fixed planar relation, said sheet mounting means being secured to said upper wall of said vacuum chamber for distributing pressure drop load forces acting on said sheets over an extended surface area of said sheets, said sheet mounting means including load distribution means secured to said upper wall of said vacuum chamber, said load distribution means having a second plurality of through openings passing therethrough, said sheet mounting means further including sheet contact means adjacently positioned to an upper surface of said load distribution means, said sheet contact means being porous.

4,065,211
PRECISION X-RAY DIFFRACTION SYSTEM INCORPORATING A LASER ALIGNER

John R. Vig, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 1, 1976, Ser. No. 662,655
Int. Cl.[2] G01B 11/26; G01N 21/00
U.S. Cl. 356—152 3 Claims



1. A method by which the angle between an atomic plane of a crystal plate and the face of the crystal plate can be determined by means of a goniometer instrument including an X-ray detector arranged to receive that portion of an incident X-ray beam reflected from said crystal plate, said crystal plate being mounted for independent rotation about three mutually perpendicular axes, a first axis being normal to the instrument plane defined by said X-ray beam and the center of said X-ray detector, a second axis being normal to the crystal plate face, and a third axis perpendicular to said first and second axes, comprising the steps of:

a. directing a collimated optical beam onto the crystal plate face for reflection therefrom onto a position sensing photodetector;

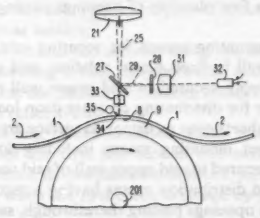
b. sequentially and controllably adjusting the rotation of said crystal plate about said first and second axes to discrete controlled positions at each of which a peak reading of the X-ray detector is obtained; and

c. adjusting the rotation of said crystal plate about said first and third axes after each of the adjustments about said second axis to obtain a null reading of said photodetector indicating correction of any wobble of said second axis introduced during step (b).

4,065,212
INSPECTION TOOL

James Garman Belleson, Hillsborough, Calif., and Kendall Clark, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 592,154
Int. Cl.[2] G01B 11/00
U.S. Cl. 356—167 17 Claims

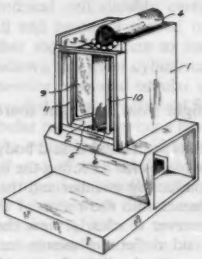


1. An inspection tool comprising: means to feed a workpiece to be inspected into a work zone, said workpiece having a pattern thereon to be inspected; a source of coherent light and means to effect a sweep of said coherent light across said work zone; a grating having a plurality of parallel interdigitated light receiving and light transmitting lines thereon; means intermediate said source of coherent light and said work zone to reflect at least a portion of said coherent light into a light beam onto and traversing said grating across said lines with said lines extending at an angle transverse said light beam imaging thereon as the light is swept across said work zone; light detector means positioned to continuously receive and sense light transmitted by said light transmitting lines of said grating so that the position of said sweep of coherent light across said work zone may be determined; and means to alter said angle of said lines transverse said reflected light beam as it sweeps across said lines on said grating to compensate for differences in the position of the pattern on a workpiece relative to a nominal pattern position.

4,065,213
APPARATUS FOR AND METHOD OF INSPECTING TUBULAR TEXTILE GOODS

Curt Lennart Nyman, Billdalsgaten 24, 502 64 Boras, Sweden

Continuation of Ser. No. 81,761, Oct. 19, 1970, abandoned. This application July 22, 1976, Ser. No. 707,755
Claims priority, application Sweden, Oct. 22, 1969, 14443/69
Int. Cl.[2] G01N 21/16
U.S. Cl. 356—200 17 Claims



1. In an apparatus, for use in the inspection of tubular textile goods, of the type including means for guiding longitudinally advancing tubular textile goods along a path of travel, and means disposed within the longitudinally advancing tubular textile goods for flattening a portion of the longitudinally advancing tubular textile goods into a web-like configuration having a pair of major opposed spaced sides jointly comprising the entire surface area of the flattened portion of the advancing tubular textile goods in order to permit simultaneous inspection of substantially the entire surface of the advancing tubular textile goods as they advance by simultaneously inspecting the pair of major opposed sides of the flattened portion of the advancing tubular textile goods, the improvement which comprises:

said means for guiding comprising means defining an open elongated narrow slot unobstructed by any structural elements of the apparatus for receiving the longitudinally advancing tubular textile goods in the flattened web-like configuration; and

said means for flattening a portion of the longitudinally advancing tubular textile goods comprising a plate-like member disposed within the tubular textile goods and dimensioned to stretch a portion of the tubular textile goods to form the flattened portion of the same and said plate-like member being sufficiently thick to prevent its passage through the slot, said plate-like member being disposed in use within the tubular textile goods above and supported by said means defining an open elongated narrow slot to flatten a portion of the tubular textile goods as

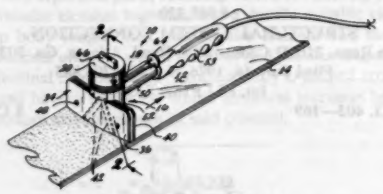
they progressively longitudinally advance over said plate-like member and through said open narrow elongated slot, said tubular textile goods conforming to the shape of the plate-like member as they advance whereby the flattened portion of the tubular textile goods is formed above said means defining an open elongated narrow slot and the major opposed sides of the flattened portion converging as the tubular textile goods advance into the open elongated slot and pass between said plate-like member and said means defining an elongated slot whereby said plate-like member forms the flattened portion of the advancing tubular textile goods while being supported by said means defining an open elongated narrow slot and is maintained positioned above the slot by the advancing tubular textile goods.

4,065,214

PORTABLE WAX APPLICATOR AND REMOVER

Emill F. Daum, 2911 Via San Gorgonio, San Clemente, Calif. 92672; Terry R. Daum, 34581 Via Verde, Capastrano Beach, Calif. 92624, and Dennis Daum, 2911 Via San Gorgonio, San Clemente, Calif. 92672

Filed Aug. 30, 1976, Ser. No. 718,460
Int. Cl.² A46B *11/08*; A47L *13/32*; B43M *1/02*
U.S. Cl. 401—2 **7 Claims**



1. A portable wax applicator comprising:
a housing member having an open upper surface for containing wax to be applied, said housing member having an aperture through the bottom wall thereof;
a handle attached to and extending from said housing member;
a spreader member positioned transverse to said handle and attached to said bottom wall and extending downward therefrom; and
a heater means;
said spreader member comprising a pair of flat plate members secured together with said heater means sandwiched therebetween, one of said plate members having wax distributing channels in alignment with and extending from said aperture in said bottom wall to the lower periphery of said spreader, said heater element having substantially the same surface area as said plate members.

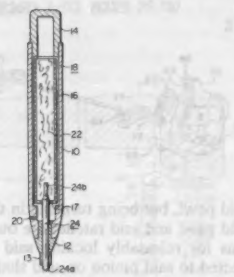
4,065,215

WRITING INSTRUMENT

Katsumi Otsuka, Funabashi, Japan, assignor to Topian Manufacturing Inc. and Teibow Company Limited, both of, Japan

Filed Jan. 14, 1976, Ser. No. 648,840
Claims priority, application Japan, Jan. 14, 1975, 50-7783[U]
Int. Cl.² B43K *8/00*
U.S. Cl. 401—199 **4 Claims**

1. In a writing instrument comprising a cylindrical casing having a rear end and a forward end axially spaced apart from each other, an ink reservoir in said casing, and a writing nib having its rear end in said ink reservoir and its forward end projecting from the forward end of said casing, said nib having a rounded tip portion extending forwardly from said forward end of the casing and having an inner capillary conduit which extends axially through the nib;
the improvement wherein said inner capillary conduit forms, in a transverse cross section of the nib, at least one straight slit which extends from the center of the cross section toward the outer periphery of the nib in the substantially radial direction of the cross section, and forms a plurality of radially spaced apart arc shaped slits which are coaxial



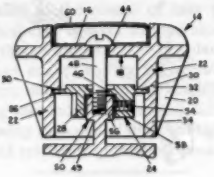
with each other about said center, a part of each of said arc shaped slits interconnecting with said straight slit, said radially spaced apart arc shaped slits being opened to a rounded outer surface of the tip portion.

4,065,216

ADJUSTABLE FAUCET HANDLE ASSEMBLY

Merritt J. Nelson, Sparta, Mich., assignor to Zin-Plas Corporation, Grand Rapids, Mich.

Filed Sept. 17, 1976, Ser. No. 725,085
Int. Cl.² F16B *1/00*
U.S. Cl. 403—4 **8 Claims**



1. A faucet handle assembly comprising:
a skirt on the handle having a hollow interior and retaining sides;
an insert; and
two sets of alterate interengaging means on the skirt and insert each of the sets having means for preventing relative rotation in clockwise and counterclockwise directions between the skirt and insert, said interengaging means being so shaped as to provide one axial position of the insert within the skirt when one interengaging means is operative and providing a second axial position of the insert when the second interengaging means is operative.

4,065,217

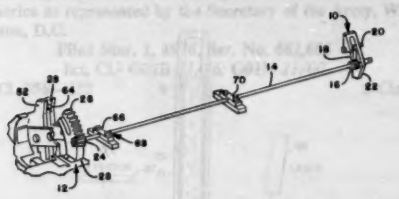
NOSE TIP LOCKING DEVICE

John A. Andersen, and Gene R. Harty, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 24, 1976, Ser. No. 744,472
Int. Cl.² F16B *1/00*
U.S. Cl. 403—24 **5 Claims**

1. A mechanism for releasably locking a nose tip to a vehicle comprising:
a shaft having first and second ends, the first end of said shaft comprising a ratchet and the second end of said shaft comprising a pinion;

means comprising a pawl, operably connected to said first end of said shaft, for engaging said ratchet, said ratchet being turnable in only one direction while engaged with



said pawl, but being turnable in the other direction when said pawl and said ratchet are out of contact; and

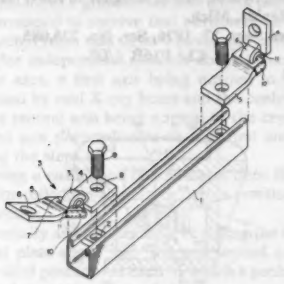
means for releasably locking said nose tip operably connected to said pinion on said shaft.

4,065,218

SEISMIC BRACE

John D. Biggane, Oakland, Calif., assignor to Super Strut, Inc., Oakland, Calif.

Filed Nov. 10, 1976, Ser. No. 740,557
Int. Cl.[2] F16C *11/00*
U.S. Cl. 403—71 2 Claims



1. An articulated connection comprising

a pair of flat plates,

one plate having a transverse slot adjacent one end thereof,

a tongue on one end of the other plate inserted through said slot, turned upon itself and having its end welded to said other plate,

an acoustical snubber coating bonded to all sides of said slot and to all surfaces of said one plate adjacent said slot,

each plate having a hole adjacent its other end for receiving a securing element,

and a member of substantially U-shaped cross-section,

a nut fixed near each end of said member, and a bolt extended through said hole of said one plate and secured in said nut thereby to form a pivotal connection for said end of said member.

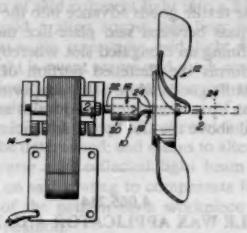
4,065,219

SHAFT ADAPTER

Fred Levine, P.O. Box 380876, Miami, Fla. 33138

Filed Aug. 26, 1976, Ser. No. 718,039
Int. Cl.[2] F16D *1/00*
U.S. Cl. 403—287 3 Claims

1. In combination with a fan motor having a shaft and with a fan blade, a shaft adapter for mounting the fan blade on the shaft of the fan motor, the shaft adapter comprising an elongated member having a pair of spaced ends, a socket portion forming one of the ends and a shaft portion forming the other of the ends, with the socket portion being arranged for receiving a shaft of a fan motor for rotation with the shaft, and the shaft portion being arranged for mounting a fan blade for rotation with the member, the socket portion being provided with a receptacle arranged for receiving the shaft of the fan motor, and wherein the shaft portion includes a longitudinally



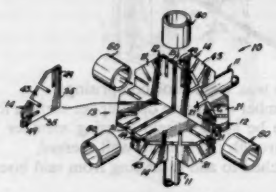
extending shaft, there being a plurality of adapters forming a set, each of the adapters having a receptacle of a diameter equal to the diameter of the receptacle of the other adapters, and a shaft having a diameter different from the diameters of each of the other adapters.

4,065,220

STRUCTURAL SYSTEM CONNECTION

Wayne Ruga, 2163D Coosawattee Road, Atlanta, Ga. 30319

Filed July 16, 1976, Ser. No. 705,885
Int. Cl.[2] F16B *7/04*
U.S. Cl. 403—169 8 Claims



1. An interlocking structural system comprising:

a plurality of tubular strut members defining a central opening in the ends thereof of a prescribed diameter; and,

at least one connector for selectively interconnecting said plurality of tubular strut members, said connector including a plurality of removably interconnected plate members, one of said plate members lying generally in a first plane; at least a second of said plate members lying generally in a second plane intersecting said first plane so that said plate members intersect along a first common line and at least a third of said plate members lying generally in a third plane transversely intersecting said first and second planes at a point of intersection intermediate the ends of said first common line, intersecting said first plane along a second common line and intersecting said second plane along a third common line; each of said plate members defining a plurality of connector tangs thereon generally radially oriented with respect to said plate member, one of said connector tangs on said one of said plate members intersecting one of said connector tangs on said another of said plate members along one of said common lines, said connector tangs sized to be received in said central opening in the end of one of said strut members so that said strut member can be slipped over said intersecting connector tangs to connect said strut member to said connector and to hold said plate members together whereby said connector, when assembled, supports said tubular struts simultaneously with said tubular struts holding said connector assembled.

4,065,221

CLAMP FOR SHEATHED ROD, STRAND OR ROPE

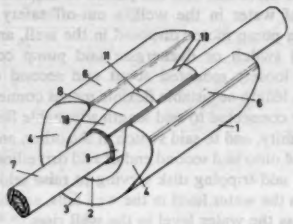
Stephen Cawthorne, Wadworth, near Doncaster, England, assignor to Bridon Limited, Yorkshire, England

Filed Dec. 3, 1975, Ser. No. 637,240

Claims priority, application United Kingdom, Dec. 3, 1974, 52211/74

Int. Cl.[2] F16G *11/00*

U.S. Cl. 403—284 9 Claims



1. A clamp for application to a plastics-sheathed line, comprising a hard tubular element divided longitudinally into at least two separable parts, retaining means for holding parts of said tubular element together, and a ductile metallic elongate clamp body longer than said tubular element and having a longitudinal channel which receives said tubular element said longitudinal channel being of substantially U-shaped cross-section and having side walls whose thickness increases between the bottom and the mouth of said channel.

4,065,222

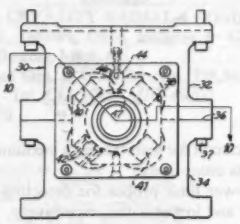
POT BROACH

Eugene J. Bistrick; Axel B. Abrahamsson, both of Warren; Andrew J. Szewczyk, Harper Woods; Frank A. McCabe, Detroit; Richard A. Schlaf, Sterling Heights, and Leonard A. Gabriele, Warren, all of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Oct. 20, 1976, Ser. No. 734,301

Int. Cl.[2] B26D *1/00*

U.S. Cl. 407—18 9 Claims



1. A pot broach assembly for cutting a multiplicity of gear teeth on the periphery of an initially cylindrical blank in a single pass, said assembly comprising

a longitudinally segmental rigid tubular support body,

a first series of flat sided abutting internally toothed cutting rings, each ring having a multiplicity of cutting teeth arranged in a single circumferentially extending array, and

a second series of flat sided abutting locating and support rings, said second series rings having internally open, radially extending, circumferentially spaced slots, flat sided elongated sticks received in said slots, said sticks having progressively stepped cutting teeth adapted to remove material from the bottom of tooth spaces cut by the cutting teeth of said first series of rings.

4,065,223

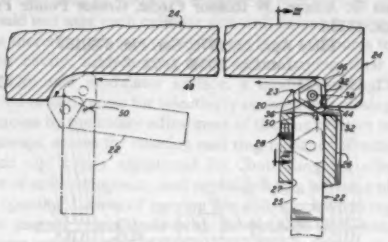
DISPOSABLE CUTTING INSERT AND TOOL HOLDER THEREFOR

Stanford C. Nelson, 8 S. Merrill Ave., Park Ridge, Ill. 60068

Filed July 31, 1975, Ser. No. 600,264

Int. Cl.[2] B26D *1/00*; B23B *29/00*

U.S. Cl. 407—114 3 Claims



3. An indexible carbide cutting tool insert comprising a pair of parallel spaced mounting surfaces and three side walls disposed at uniform angles relative to one another and extending perpendicularly between said parallel mounting surfaces and forming cutting edges at the juncture of each face and side wall, each side wall being joined to an adjacent side wall by a nose-cutting radius with each nose-cutting radius having a pair of spaced cutting flats formed thereon and extending between the parallel mounting surfaces and providing a cutting edge flat at the juncture with each parallel mounting surface, each parallel mounting surface of the cutting tool insert including a stepped nose chip breaker formed adjacent each nose-cutting radius and parallel to the planes of said parallel mounting surfaces, a stepped chip breaker formed along each side wall for cooperation therewith parallel to the planes of said parallel mounting surfaces and extending between each pair of said nose chip breakers, said nose chip breakers and said chip breakers formed along said mounting surfaces and extending along said side walls being disposed at different elevational levels to provide a stepped relationship therebetween.

4,065,224

TWIST DRILLS

Keith Siddall, Sheffield, England, assignor to Osborn-Mushet Tools Limited, Sheffield, England

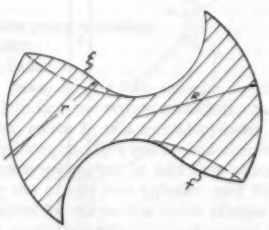
Continuation of Ser. No. 579,085, May 19, 1975, abandoned.

This application Oct. 7, 1976, Ser. No. 730,442

Claims priority, application United Kingdom, May 17, 1974, 22130/74

Int. Cl.[2] B23B *51/00*

U.S. Cl. 408—230 6 Claims



1. A twist drill having a cross-sectional shape which is convex in the surfaces of the drill faces, the convexity being of such an extent that it conforms substantially to a radius of between 0.9 and 1.2 of the drill radius, the lip rake angle being substantially constant along the cutting edges radially out-

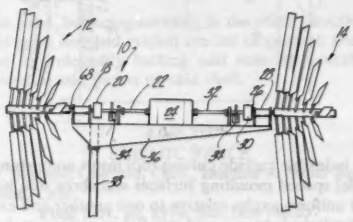
wards of the core portion of the drill, the helix angle being between 25° and 45°, and the point angle being between 90° and 150°, whereby the cutting edges are curved but contained in the surface of an imaginary cone so that the drill can be sharpened on a conventional machine.

4,065,225

MULTIVANE WINDMILL

William D. Allison, 39 Radnor Circle, Grosse Pointe Farms, Mich. 48236

Filed Apr. 22, 1976, Ser. No. 679,157
Int. Cl.² F03D *1/02, 7/04*
U.S. Cl. 416—121 **6 Claims**



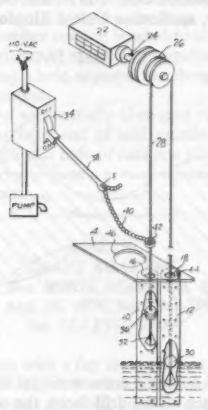
1. A windmill comprising; a rotor rotatable on a horizontal axis extending in the direction of the wind, said rotor comprising a plurality of pairs of diametrically opposed vanes, said vanes being pitched equally and in the same direction to cause rotation of the rotor in one direction, each pair of vanes progressing rearwardly away from the forward end of the axis being offset circumferentially relative to the preceding pair of vanes and in the direction of rotation of the rotor, said rotor including a hub assembly including an axially extending torque member, a support member for each pair of vanes extending radially and in opposite directions from said torque member, and a shaft passing through all of said support members and retaining said support members fixed relative to said torque member.

4,065,226

WATER WELL MONITOR

Gordon M. Campbell, 17700 N. Highway 101, Willits, Calif. 95490

Filed Dec. 1, 1976, Ser. No. 746,295
Int. Cl.² F04B *49/04*
U.S. Cl. 417—40 **5 Claims**



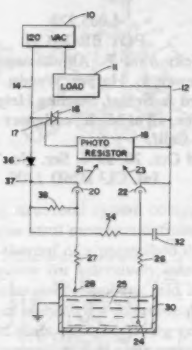
1. A well monitor comprising in combination a mechanical counter, a rotatable shaft actuating said counter, a sheave on said rotatable shaft, a drive-line passing over said sheave and having a first end of said drive-line depending from one side of said sheave to extend down the well, a float secured to the end of said first end adapted to float on the surface of the water in the well, a second end of said drive-line depending from the other side of said sheave to extend down into the well, a weight on said second end of said drive-line, said sheave having a circumference such that when a unit of lengths of said drive-line passes over said sheave, said counter indicates numerically the length of drive-line that has passed to indicate changes of the depth of water in the well, a cut-off safety switch for turning off a pump motor disposed in the well, and means to actuate said switch or deenergize said pump comprising a heavy ring loosely mounted about said second end of said drive-line, a length adjustable flexible means connected to said ring, a lever connected to said length adjustable flexible means at one extremity, and to said switch at the other, and a tripping disk clamped onto said second end of said drive-line below said heavy ring, said tripping disk serving to raise said heavy ring upwardly as the water level in the well falls, and to lower said heavy ring as the water level in the well rises.

4,065,227

CONTROL CIRCUIT

Ronald N. Rose, 5960 Main St. NE., Minneapolis, Minn. 55432

Filed Aug. 17, 1976, Ser. No. 715,190
Int. Cl.² F04B *49/00;* G02B *27/00;* H03K *3/42*
U.S. Cl. 417—45 **9 Claims**



1. A control circuit for maintaining a medium between upper and lower limits comprising:

upper and lower limit probes for detecting the medium at said upper and lower limits respectively;

medium control means to move said medium at least between said upper and lower limits;

a power source;

a switching means controlled by a radiation sensitive means, said medium control means and said switching means connected in series across the power source;

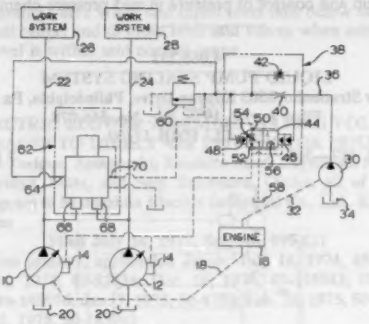
a first radiation producing means connected to and operable by the voltage from the connection point between the medium control means and the switching means, said first radiation producing means controlled by a signal from said lower limit probes; and

a second radiation producing means connected to the circuit on the other side of the switching means from said first radiation producing means and controlled by said upper limit probe, both of said radiation producing means situated to direct radiation at the radiation sensitive means.

4,065,228
HYDRAULIC CONTROL FOR VARIABLE DISPLACEMENT PUMPS

William D. McMillan, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 24, 1977, Ser. No. 771,506
Int. Cl.² F04B 49/00
U.S. Cl. 417—212 5 Claims



1. In a hydraulic system for controlling the output of at least one variable displacement pump driven by a single prime mover, the combination of:

a source of pilot fluid under pressure including a fixed displacement pump adapted to be driven by the prime mover proportional to the speed thereof;

means defining an underspeed control valve connected to said source and having an inlet and an outlet adapted to be connected to the variable displacement pump (s) for controlling the displacement thereof; and

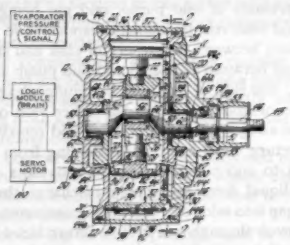
load sensing means having an input connected to said source and adapted to be associated with said variable displacement pump(s) for sensing the loading thereon, and having an output connected to said inlet for directing a fluid signal thereto proportional to a sensed load;

whereby changes in speed of the prime mover will not affect displacement of the variable displacement pump (s) unless it is loaded in excess of a predetermined amount.

4,065,229
VARIABLE CAPACITY RADIAL-4 COMPRESSOR

Dennis A. Black, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 1, 1976, Ser. No. 728,545
Int. Cl.² F04B 1/10, 49/00
U.S. Cl. 417—270 4 Claims

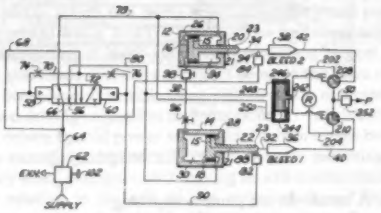


1. A radial compressor of the type including a cylinder housing having a unit axis and cross bores including cylinder walls therein along axes normal to each other forming compression chambers, the axes of said cylinder bores intersecting in a common transverse plane diametrical to said cross bores; a drive shaft on said unit axis rotatably mounted in the closed ends of said housing with said unit axis normal to said transverse plane at the intersection of said cross bore axes, a piston slidable in each of said bores, means forming inlet and outlet valves for said compression chambers, means in said housing operatively related to the pistons to reciprocate the pistons in said bores as said shaft is rotated, said cylinder housing being formed to include suction and discharge cavities, wherein the improvement comprises a circular recess being formed in one end of said housing having a modulator port surface coaxial with said unit axis; each cylinder side wall having housing port means therethrough for conveying gas from said bores to said suction cavity, said housing port means having their exits located in said modulator surface, a modulator ring being mounted in said recess for selectively opening and closing said port means by the rotary adjustment of the ring relative to said port means, means for rotating said ring in either direction to provide said rotary adjustment for controlling the effective output of said compressor, said modulator ring having a plurality of openings therein of varying size and operative to register in one manner respectively with the housing port means of each bore upon rotation of said ring to a first position, whereby each of the housing port means is open allowing gas to flow from the compression chamber of each bore to said suction cavity so that a minimum of pumping work is done on the gas, and said modulator ring openings operative to register in a second manner respectively with the housing port means of each bore upon rotation of said ring in one direction a predetermined angular distance to a second position, whereby said ring closes each of said port means so that said compressor pumps at maximum capacity.

4,065,230
RECIPROCATING INFUSION PUMP AND DIRECTIONAL ADAPTER SET FOR USE THEREWITH

Walter A. Gezari, Killingworth, Conn., assignor to Hart Associates, Inc., East Hartford, Conn.

Continuation-in-part of Ser. No. 541,882, Jan. 17, 1975, abandoned. This application Oct. 24, 1975, Ser. No. 625,581
Int. Cl.² F04B 9/08, 35/02
U.S. Cl. 417—317 18 Claims



1. An infusion pump including:

a first cylinder;

a second cylinder;

first piston means in said first cylinder dividing said first cylinder into first and second chambers;

second piston means in said second cylinder dividing said second cylinder into first and second chambers;

first rod means connected to said first piston means and extending out of said first cylinder, said first rod means being adapted for connection to the plunger of a syringe;

second rod means connected to said second piston means and extending out of said second cylinder, said second rod means being adapted for connection to the plunger of a syringe;

hydraulic conduit means connecting said first chamber of said first cylinder to said first chamber of said second cylinder for fluid communication therebetween;

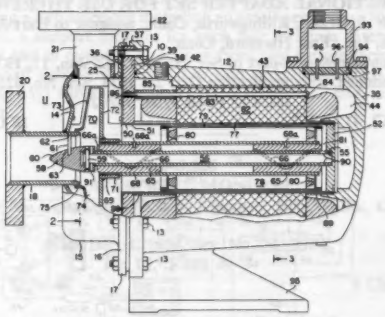
incompressible fluid means in said first chamber of each of said cylinders and in said hydraulic conduit means;
actuator means for positioning valve means to control the flow of a fluid to and from said syringes;
third cylinder means;
third piston means in said third cylinder means, said third piston means being operatively connected to said actuator means;
delivery means for delivering fluid under pressure to said second chambers of said first and second cylinders and to said third cylinder means; and
control means for alternately delivering fluid through said delivery means to the second chamber of one of said cylinders to activate the piston means associated therewith and transfer fluid from the first chamber of said one cylinder to the first chamber of the other cylinder and then to the second chamber of the other of said cylinders to activate the piston means associated therewith and transfer fluid from the first chamber of said other cylinder to the first chamber of said one cylinder, said control means further alternately delivering fluid under pressure to opposite sides of said third piston means to cause said third piston means to operate said actuator means in synchronism with said first and second piston means.

4,065,231

MOTOR DRIVEN PUMP

David P. Litzenberg, 1523 Bryant Lane, Meadowbrook, Pa. 19046

Continuation-in-part of Ser. No. 541,491, Jan. 27, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,303
Int. Cl.[2] F04B *17/00, 35/04*
U.S. Cl. 417—357 **5 Claims**



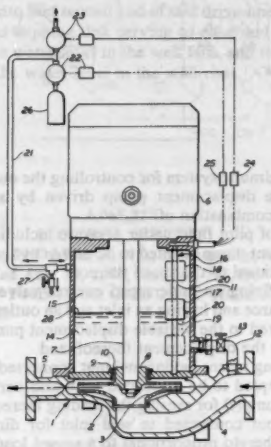
1. A motor driven pump comprising
a rigid post member,
an impeller housing carried by said post member on one side thereof and having a fluid inlet connection and a fluid delivery connection communicating with the interior thereof,
a motor housing carried by said post member on the other side thereof, and having a motor stator therein,
said post member having a motor stator isolating sleeve extending therefrom and into said motor housing interiorly of said motor stator,
said sleeve having an end closure remote from said post member,
a hollow mandrel carried at one end in said impeller housing and at the other end in said end closure,
a rotary impeller shaft journalled on said mandrel and movable axially thereon,
an impeller in said impeller housing secured to said shaft and a motor rotor in said motor housing and in spaced relation to said sleeve,
said motor rotor being in spaced relation to said sleeve to provide a fixed orifice with an inlet in communication with said impeller housing at the outlet of the impeller and with an outlet in communication with a pressure chamber between said motor rotor and said end closure,
said mandrel being in communication at one end with the inlet of said impeller and at the other end having port means communicating with said pressure chamber,
said motor rotor being longitudinally axially movable for varying the size of said port means and the discharge of fluid and control of pressure in said pressure chamber.

4,065,232

LIQUID PUMP SEALING SYSTEM

Andrew Stratienko, 8503 Elliston Drive, Philadelphia, Pa. 19118

Filed Apr. 8, 1975, Ser. No. 566,078
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—368 **7 Claims**



1. In the combination of a motor, a pump having a discharge and a suction, a rotatable shaft extending vertically downward from said motor, said shaft being operatively connected to said pump at a shaft entrance, a liquid pump sealing system comprising the elements:
a reservoir tank hermetically sealed to said pump around said shaft entrance and to the interior of said motor, said reservoir tank being partially filled with pumped liquid, said reservoir tank having a normal inherently stable liquid level range,
a volume of gas in said reservoir tank above said liquid level, said gas being at the order of and slightly in excess of the suction pressure at said pump, said gas being displaced within said reservoir tank solely responsive to a differential pressure between said reservoir tank and said suction
a bearing gap between said shaft and said pump at said shaft entrance, one side of said gap communicating with said discharge of said pump and the other side of said gap communicating with the interior of said reservoir tank, a suction return bleed line communicating from said reservoir tank to said pump suction, to provide a continuous flow of liquid from said pump discharge through said bearing gap into said reservoir and a continuous flow from said reservoir through said suction return bleed line to said pump suction, said flow being controlled responsive to pressures of said gas within said reservoir tank, said continuous flows inherently tending to equal each other, and to provide a normal inherently stable liquid level range in said reservoir tank above said suction return bleed line and below the top of said reservoir tank, said elements being the sole necessary means to maintain said liquid level inherently stable within said range during normal pump

operation, said reservoir tank including means to sense said liquid level,

a pressurized gas source controllably communicating with said reservoir tank through a pressurizing valve,

a vent controllably communicating with said reservoir tank through a venting valve,

said liquid level sensor being operatively connected to said valves to open said pressurizing valve when said liquid level rises above said normal range, and to open said venting valve when said liquid level falls below said normal range, and to close both said valves when said liquid level is within said normal range.

4,065,233

ELECTRIC BLOWER ASSEMBLY HAVING VOLUTE PASSAGES TO DIRECT AIR INTO MOTOR HOUSING

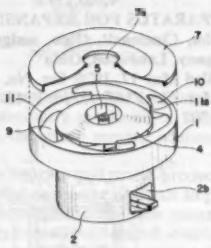
Masao Torigoe, Amagasaki; Kunihito Mori, Toyonaka; Mitsuru Tsuchiya, Suita, and Seiji Takemura, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed July 14, 1975, Ser. No. 595,421

Claims priority, application Japan, July 16, 1974, 49-81835; July 16, 1974, 49-82834; Dec. 18, 1974, 49-145942; Dec. 18, 1974, 49-145976; Jan. 7, 1975, 50-4750; Feb. 26, 1975, 50-24433; Feb. 26, 1975, 50-145941

Int. Cl.[2] F04B *35/04, 39/06*

U.S. Cl. 417—368 **5 Claims**



1. An electric blower assembly which comprises:

an electric motor having a drive shaft rotatable in one direction when said motor is energized;

at least one impeller mounted on said drive shaft for rotation together with said drive shaft;

an air guide structure comprising an air guide block having front and rear compartments formed therein, and a front cover adapted to close said front compartment with said impeller operatively accommodated in said front compartment, said front cover having a central bore formed therein in alignment with said drive shaft, said air guide structure being secured to said motor with said drive shaft rotatably extending into said front compartment through said rear compartment;

said front compartment including a circular chamber, in which said impeller is positioned, and a plurality of volute chambers substantially spirally, radially outwardly extending from and in communication with the periphery of said circular chamber;

said rear compartment opening towards said electric motor and having therein a plurality of exhaust chambers separate from each other and equal in number to the number of said volute chambers;

said motor having air inlet openings equal in number to the number of said exhaust chambers and communicating with said exhaust chambers for passage of air from said exhaust chambers into the body of said motor;

said air guide block further having passages equal in number to the number of said volute chambers, each of said volute chambers having one end terminating adjacent to and in communication with the corresponding one of said passages, said passages respectively communicating said volute chambers to the respective exhaust chambers in said rear compartment and inclined so that streams of air, which have entered the respective volute chambers after having been sucked into said front compartment through said central bore in said front cover and subsequently expelled from the outer periphery of said impeller, can smoothly flow into said exhaust chambers and, thereafter, into the body of said motor to cool the latter.

4,065,234

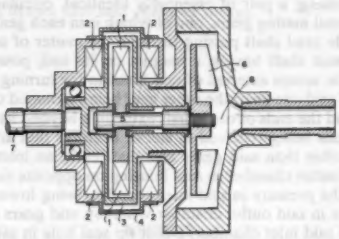
MAGNETICALLY DRIVEN ROTARY PUMPS

Honma Yoshiyuki, and Yamazaki Fumio, both of Tokyo, Japan, assignors to Nihon Kagaku Kizai Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1975, Ser. No. 643,204

Int. Cl.[2] F04B *17/00*

U.S. Cl. 417—420 **7 Claims**



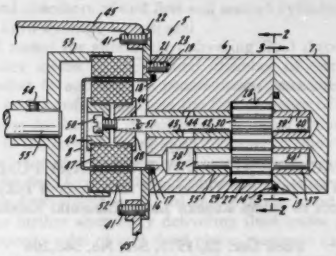
1. In a magnetically driven rotary pump driven from a power source comprising a casing, a rotary shaft rotatably mounted in said casing, a pump impeller mounted on said rotary shaft, a pump chamber means disposed about said pump impeller and in which said pump impeller operates, said pump chamber means being axially juxtaposed at one longitudinal end of said casing, at least one driven permanent magnet secured to said shaft, said driven magnet being in the form of a disc and being housed in said casing, driven means comprising at least two driving permanent magnets secured to a drive shaft which is driven by said power source, said driven means being rotatably mounted independently of the rotatable mounting of said rotary shaft, said drive shaft having its axis concentrically disposed relative to the axis of said rotary shaft and being axially juxtaposed at the side of said casing opposite to the side of the casing at which the pump housing means is axially juxtaposed, said at least two driving magnets being located outside of said casing with each driving magnet having a generally disc-like configuration having a central opening such that the latter encircles portions of said casing, said at least two driving magnets being axially spaced from one another and being located on opposite sides of said at least one driven magnet such that the latter is sandwiched between said at least two driving magnets, said at least two driving magnets being separated from said at least one driven magnet by said casing, said at least two driving magnets having outer peripheries which are connected by a joint plate disposed radially outwardly of said casing, whereby said at least one driven magnet is caused to be rotated by said at least two driving magnets by virtue of the magnetic attraction between said at least two driving magnets and said at least one driven magnet, said disposition of said at least two driving magnets on opposite sides of said at least one driven magnet resulting in substantially eliminating axial thrust of said rotary pump.

4,065,235

GEAR PUMP

Donn Breen Furlong, San Rafael, and Dickey Steele Londahl, Walnut Creek, both of Calif., assignors to Tuthill Pump Company, San Rafael, Calif.

Filed June 1, 1976, Ser. No. 691,904
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—420 **5 Claims**



1. A magnetically driven gear pump isolated from its power source in a sealed housing comprising, a pair of gear cavities in said housing; a pair of essentially identical, circular toothed, hard metal mating gears, one of which is in each gear cavity; a rotatable axial shaft passing through the center of one of said gears; said shaft having a magnet on its end; power driven magnetic means external of said housing for turning said magnet and said one gear; the other gear being mounted on another shaft and the ends of each shaft extending beyond its gear, said shaft ends being received in sleeve bearings that are substantially softer than said gears and shaft ends; an inlet chamber and an outlet chamber in said housing on opposite sides of said gears; the pressure in said inlet chamber being lower than the pressure in said outlet chamber whereby said gears are biased toward said inlet chamber; a first tip seal hole in said housing below said inlet chamber and communicating with one of said gear cavities, and a second tip seal hole in said housing above said inlet chamber and communicating with the other of said gear cavities; a separate, removable stationary gear tip seal made from a non-metallic material substantially softer than said gears filling each tip seal hole and protruding slightly into said gear cavities, said tip seal being shaped like a truncated right circular cylinder which intersects one of said gear cavities, and the surface of said tip seal contacted by gear teeth being shaped like an arc of such circular gear cavity, said tip seal extending for a distance greater than the circumferential separation of the tips of the teeth of its associated gear, whereby at least one tooth of a gear will be biased against each tip seal so as to prevent leakage of liquid from said outlet chamber to said inlet chamber.

4,065,236

FUEL INJECTION PUMP FOR AN INTERNAL COMBUSTION ENGINE

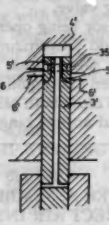
Gerald Hofer, Weissach-Flacht; Gunter Bofinger, Vaihingen, Enz; Heinz Nothdurft; Mohammad-Ali Khosrawi, both of Stuttgart; Helmut Simon, Goppingen, and Karl Konrath, Ludwigsburg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 17, 1975, Ser. No. 623,383
Claims priority, application Germany, Oct. 17, 1974, 2449333
Int. Cl.[2] F04B *7/06*; F02M *59/34*
U.S. Cl. 417—493 **4 Claims**

1. In a fuel injection pump which includes:

A. a housing within which are formed a fuel chamber, a cylindrical bore and at least one connecting channel between said chamber and said bore;

B. a pump piston, disposed to move rotatably and axially within said cylindrical bore and defining with said housing a pressure chamber as part of the cylindrical bore, said pump piston being provided with longitudinal grooves at one end thereof, each opening into the pressure chamber and each being capable of establishing and interrupting communication between said chamber and said cylindrical bore; the improvement comprising:



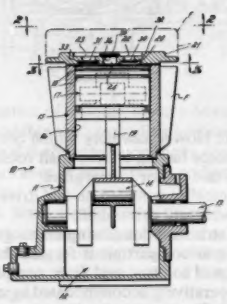
C. an annular fuel conduit formed in the pump piston to intersect each of the longitudinal grooves, said annular fuel conduit defining control edges extending transversely to the pump axis which control obturation of the annular fuel conduit during the axial excursion of the pump piston and after the onset of the pressure stroke of the piston.

4,065,237

VALVE APPARATUS FOR EXPANSIBLE CHAMBER

Walter J. Webb, Cincinnati, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed May 17, 1976, Ser. No. 687,098
Int. Cl.[2] F16K *15/16*; F04B *21/00*
U.S. Cl. 417—503 **25 Claims**



1. In an expansible compression chamber apparatus operatively connected to intake means and to exhaust means, and having an expansible chamber defined in part by a cylinder head, an improved intake valve apparatus connecting said chamber to a common pressure fluid source and comprising:

two laterally spaced intake ports in said head defining said intake means, said ports operatively connected to said expansible compression chamber and through which a fluid to be compressed is introduced into said chamber from said common pressure fluid source,

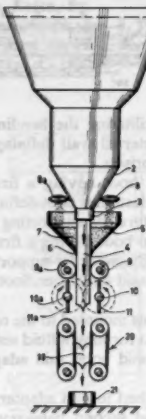
a first valve member disposed and biased to normally positively close one intake port, said first valve member opening said one port in response to a first intake pressure differential, and

a second valve member spaced from the first valve member and disposed and biased to normally positively close another of said intake ports, said second valve member opening said other port in response to a second intake pressure differential different from said first intake pressure differential.

4,065,238
APPARATUS FOR MANUFACTURING MOLDED ARTICLES FROM A KNEADABLE MATERIAL, E.G., CLAY

Hendrik Sinnema, Sneek, Netherlands, assignor to Machinefabriek W. Hubert & Co. B.V., Sneek, Netherlands

Division of Ser. No. 541,035, Jan. 14, 1975. This application Mar. 24, 1977, Ser. No. 780,947
Int. Cl.² B28B *13/02*
U.S. Cl. 425—94 6 Claims

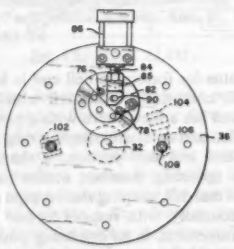


1. An apparatus for making molded articles comprising:
a. means for continuously producing a vertical strand of plastic material, the strand moving continuously along a vertical path,
b. means vertically beneath said strand-producing means for severing the strand at regular intervals to produce a succession of individual pieces of plastic material,
c. a mold vertically beneath said strand-severing means, and
d. means vertically beneath said strand-severing means and vertically above said mold for receiving each individual piece and for throwing each piece along the vertical path into said mold with sufficient kinetic energy that the piece plastically deforms and fills the mold.

4,065,239
JAM PREVENTION DEVICE FOR EXTRUSION PROCESS

Alex Sandor Gergely, Bon Air, Va., assignor to Philip Morris, Inc., Richmond, Va.

Continuation of Ser. No. 623,497, Oct. 17, 1975, abandoned. This application Feb. 9, 1977, Ser. No. 766,965
Int. Cl.² B29F *3/00*
U.S. Cl. 425—141 5 Claims

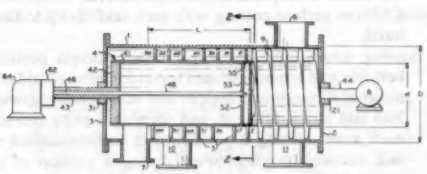


1. In an apparatus for forming a continuous thermoplastic workpiece including means for extruding a continuous workpiece of thermoplastic material as an extrudate of predetermined dimension, chamber means for receiving a liquid coolant therein, means for advancing the extrudate from said extruding means through a sizing aperture in said chamber means and through said chamber means, detection means for detecting any outsized variation dimension of the extrudate from a predetermined dimension beyond a certain allowable limit as the extrudate enters said sizing aperture, and means responsive to the detection by said sensing means of an outsized extrudate for moving rectilinearly a linking rod coupled thereto from a first to a second position, a cutter mechanism actuated upon movement of said linking rod from said first to said second position for severing the extrudate,
wherein the improvement comprises:
a cutter blade having an extended, curved cutting edge and being coupled to said rectilinearly movable linking rod for actuation thereby; and
said cutter blade being pivotally mounted to a fixed support at a point offset from its center to permit rapid rotation of said cutter blade across the path of the extrudate adjacent said aperture as said linking rod is moved rectilinearly from its first to its second position, thereby amplifying the effect of the rectilinear motion and effecting a rapid severing of the extrudate to prevent further extrudate from being drawn into said chamber means.

4,065,240
CARBON BLACK PELLETER WITH EVEN PIN DISTRIBUTION

Clinie E. Cole, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 15, 1976, Ser. No. 705,482
Int. Cl.² B01J *2/10*
U.S. Cl. 425—222 8 Claims



1. A carbon black pelleter comprising
a. a housing with a cylindrical internal surface,
b. a shaft coaxially and rotatably arranged within said housing; and
c. a plurality of pins evenly distributed on said shaft with the pin density being approximately the same for the entire length of the shaft, said pins extending essentially radially outwardly from said shaft into close proximity with the internal surface of the housing, and wherein said pins are arranged on the shaft so that the pitch of axially adjacent pins, defined by the formula

$$p = 360° / a \cdot t$$

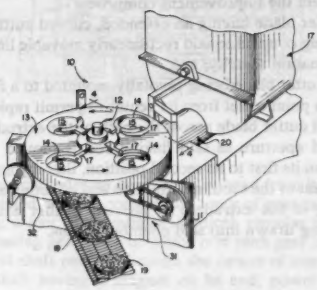
wherein p is the pitch of axially adjacent pins, a is the azimuthal angular distance in degrees between axially adjacent pins along the shaft and t is the axial distance between these axially adjacent pins, changes at least one time.

4,065,241

MOLDING APPARATUS AND METHOD

Gerald J. Orlowski, Scottsdale, Ariz., assignor to Armour and Company, Phoenix, Ariz.

Filed July 14, 1976, Ser. No. 705,160
The portion of the term of this patent subsequent to Sept. 21, 1993, has been disclaimed.
Int. Cl.[2] A23P *1/00*
U.S. Cl. 425—228 3 Claims



1. In an apparatus for forming a plurality of uniformly shaped patties from a mass of agglomerable edible material; said apparatus including:

a frame;

a drive means retained on said frame;

a hopper attached to said frame for receiving a mass of said edible material;

a turret rotatably mounted to said frame and drivingly connected to said drive means including a plurality of cavities located in spaced angular and radial relation therearound, each cavity having a barrier means mounted for reciprocal movement axially therein, each said barrier means having a bottom surface coating with each said cavity to form a mold;

housing means including auger means therein positioned between said hopper and said turret for moving said edible material through said hopper and substantially upwardly into said mold, filling it, and forming a patty therein as each mold opening is positioned in communication with said material moving means during a portion of each turret rotation;

means coacting with the turret for reciprocating said barrier means through said cavity as said turret rotates to push a patty substantially downwardly out therefrom at a portion of rotation substantially opposite the patty-forming portion; and

means connected to the frame for separating a patty from said barrier means in a manner preventing its deformation during separation;

the improvement wherein said patty separation means includes:

opposing spatially related pulley means mounted on said frame,

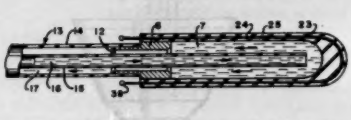
a continuous wire band mounted on and between said pulley means for movement in a loop therearound, and a portion of said band loop being positioned adjacent the bottom of said turret with said band crossing the surface of said barrier means at the lowest portion in the path of travel thereof.

4,065,242

DEVICE FOR FACILITATING THE BENDING AND FORMING OF PLASTIC PIPE OR OTHER STRUCTURES

John W. Dickey, Stanardsville, Va., and Larry F. Babb, Sandusky, Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Filed July 8, 1976, Ser. No. 703,527
Int. Cl.[2] B29C *17/06*
U.S. Cl. 425—384 11 Claims



1. A device for facilitating the bending and forming of a structure having an internal wall defining an opening in said structure, which comprises:

a tubular elastomer boot having a first closed end and a second end, said elastomer boot defining a mandrel insertable in said structure for supporting the internal wall of said structure, said boot having a first diameter for insertion and a second diameter for supporting the internal wall of said structure, said elastomer boot including a support wall;

adapter closure means mounted to the open end of said boot, said adapter means forming a fluid seal for said boot along the open end of said boot, said adapter having an axial opening in it;

conduit means attached to said adapter, said conduit means including first and second passageways communicating with said tubular boot, said conduit means forming a fluid seal with said adapter means; and

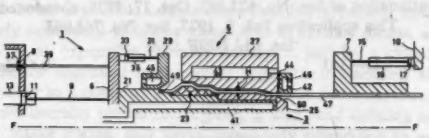
means for heating said structure to bending temperature by heat transfer outwardly from said elastomer boot to said structure, said heater means comprising an electrically operable device associated with said support wall.

4,065,243

APPARATUS FOR FORMING A THICKENED BELL END ON THERMOPLASTIC PIPE

Petrus Marinus Acda, and Jacob Karreman, both of Enkhuizen, Netherlands, assignors to Polva Nederland B.V., Enkhuizen, Netherlands

Division of Ser. No. 607,770, Aug. 26, 1975, Pat. No. 4,006,757.
This application Oct. 7, 1976, Ser. No. 730,362
Claims priority, application Netherlands, Feb. 28, 1975, 7502374
Int. Cl.[2] B29C *1/12*
U.S. Cl. 425—393 4 Claims



1. An apparatus for forming a bell end in a pipe of thermoplastic material, comprising a mandril which is symmetrical about an axis and has a metal core with a pipe clamp end and a bell end portion and an elastic shaping ring around said core between said end and end portion, a shaping sleeve, pipe clamp, and an upsetting member; means for mounting and positioning said mandril, shaping sleeve, pipe clamp and upsetting member coaxially with respect to one another and for relative axial movement, in an operating position the mandril and shaping sleeve being concentrically arranged and bounding an annular shaping space between outer diameters of the mandril and inner diameters of the shaping sleeve, said outer and inner respective diameters increasing along conical transi-

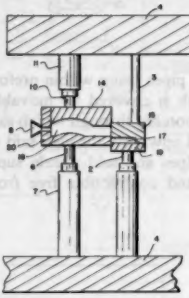
tion portions between cylindrical steps, from the pipe clamp end of the shaping mandril to a sealing chamber portion of the annular shaping space, and decreasing again to the bell end portion, the height of the shaping space increasing from the pipe clamp end of the shaping mandril to a surface in the sealing chamber and decreasing again.

4,065,244

APPARATUS FOR MOLDING POLYMERIC MATERIALS

Alan I W Frank, Pittsburgh, Pa., assignor to The Alan I W Frank Corporation, Exton, Pa.

Division of Ser. No. 539,483, Jan. 8, 1975, abandoned. This application June 10, 1976, Ser. No. 694,596
Int. Cl.[2] B29C *3/00*
U.S. Cl. 425—412 4 Claims



1. A molding apparatus comprising first and second mold cavities adapted for communication with each other to define a product to be molded, said first mold cavity formed by a pair of mold sections, at least one of said sections being movable with respect to said other section for increasing or decreasing the volume of said first mold cavity whereby decreasing said volume substantially defines that portion of the product to be molded in said first mold cavity, means for moving at least one of said sections operably connected thereto, and means for admitting material to be molded into said first mold cavity; said second mold cavity of fixed volume defining the remaining portion of the product to be molded and adapted for communication with said first mold cavity; and means for bringing said mold cavities into communication with each other to define the product to be molded.

4,065,245

APPARATUS FOR PRODUCING SHEETING HAVING A FIBROUS SURFACE

Hugo Brendel, Memmingen, and Heinz Federau, Amending, both of Germany, assignors to Metzeler Schaum GmbH, Memmingen, Germany

Division of Ser. No. 498,928, Aug. 20, 1974, Pat. No. 4,000,230. This application Sept. 14, 1976, Ser. No. 723,134
Claims priority, application Austria, Aug. 21, 1973, 7267/73; July 26, 1974, 6185/74
Int. Cl.[2] B29C *23/00*
U.S. Cl. 425—503 7 Claims

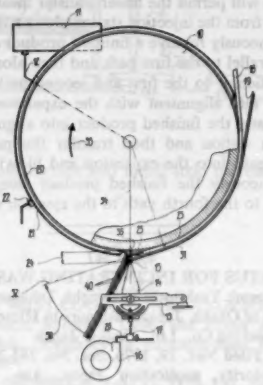
1. In an apparatus for manufacturing of a product comprising a carrier web and a fibrous surface formed from a non-fibrous polymer, which apparatus comprises means for supplying a polymer to a zone intermediate the carrier web and a heatable drawing surface, means for heating the polymer to render it molten, means for separating the carrier web and the drawing surface to provide a fiber-forming region in which fibers are formed from the molten polymer and adhere to the surface of the carrier web, and means for introducing a fluid into the fiber-forming region, the improvement comprising:

a. means for heating the molten polymer at a temperature of at least the melting point of the polymer;

b. means for separating the carrier web from the drawing surface to create a fiber forming region; and

c. at least one nozzle means positioned and arranged to:

1. introduce the fluid at a point contiguous to the carrier web and on the reverse side of said web directly opposite to the fiber forming region, whereby the fluid is



directed through the web into the fiber-forming region, and

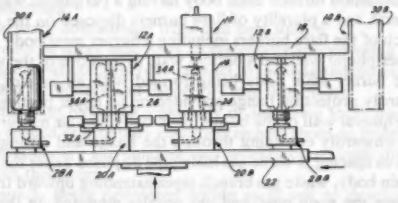
2. deflect the carrier web having fibers formed thereon by an angle of 5°–90° in a direction away from the drawing surface and in the area in which the fluid is directed through the carrier web.

4,065,246

INJECTION BLOW MOLDING APPARATUS

Paul Marcus, 85 Pascack Road, Pearl River, N.Y. 10965

Continuation of Ser. No. 551,274, Feb. 20, 1975, abandoned, and a continuation-in-part of Ser. No. 558,819, March 16, 1975, Pat. No. 3,990,826, which is a continuation of Ser. No. 318,703, Dec. 27, 1973, abandoned, which is a division of Ser. No. 158,161, June 30, 1971, Pat. No. 3,776,991. This application July 20, 1976, Ser. No. 707,087
Int. Cl.[2] B29D *23/03*
U.S. Cl. 425—528 35 Claims



1. An ejection blow molding apparatus for making plastic receptacles comprising:

an injection station, including means at the injection station injection molding a parison of selected configuration;

an expansion and blowing station including means to position the parison and then to expand the parison to a predetermined length and then to blow mold the parison into a predetermined lateral and final configuration;

an ejection station with product removing means at the ejection station removing the finished product from the apparatus;

the injection station, expansion and blowing station, and ejection station being positioned in an adjacent linear side-by-side cooperating arrangement;

a linear transfer means being reciproally movable toward

and away from the injection station, expansion, and blowing station, and ejection station and being reciprocally movable in a path perpendicular to the direction of reciprocal movement toward and away from the stations;

the linear transfer means being positioned with respect to the injection station, expansion and blowing station, and ejection station so that movement thereof away from the stations will permit the linear transfer means to remove a parison from the injection station along a first path and to simultaneously remove a finished product along a second path parallel to the first path and then along a third path perpendicular to the first and second paths to bring the parison into alignment with the expansion and blowing station and the finished product into alignment with the ejection station and then transfer the parison along a fourth path into the expansion and blowing station and simultaneously the finished product along a fifth path parallel to the fourth path to the ejection station.

4,065,247

APPARATUS FOR INCINERATING WASTE GASES

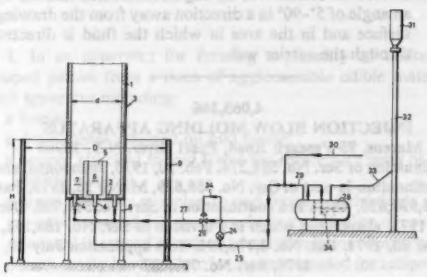
Noboru Okigami; Yoshitoshi Sekiguchi; Takusen Ito, and Kenji Onose, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan

Filed Nov. 19, 1976, Ser. No. 743,251

Claims priority, application Japan, Apr. 16, 1976, 51-48244[U]

Int. Cl.² F23D *13/20*

U.S. Cl. 431—202 **9 Claims**



1. An apparatus for incinerating a waste gas comprising a combustion furnace main body having a peripheral wall and a hearth and a plurality of flare burners disposed on the hearth, each of the flare burners including a burner main body having a peripheral wall and a bottom wall, at least one of the walls of the burner main body being formed with air intakes, an inwardly projecting flange provided on an upper portion of the peripheral wall of the burner main body, gas-air mixture tubes downwardly extending through the flange and arranged at a given spacing, a waste gas main pipe disposed under the burner main body, waste gas branch pipes extending upward from the waste gas main pipe, and gas nozzles mounted on the upper ends of the waste gas branch pipes respectively and positioned at the lower ends of the gas-air mixture tubes.

4,065,248

GROUND FLARE

John F. Straitz, III, Meadowbrook, and Vicente A. Mendoza, Norristown, both of Pa., assignors to National Airoil Burner Co., Inc., Philadelphia, Pa.

Filed Jan. 8, 1976, Ser. No. 647,362

Int. Cl.² F23D *13/24;* F16L *1/02*

U.S. Cl. 431—202 **2 Claims**

1. A flare for use on the ground comprising

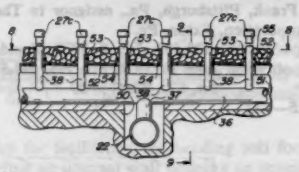
wall members enclosing a space,

a waste gas supply main,

a plurality of horizontally disposed branch pipes extending from said waste gas supply main and within said space,

a plurality of nozzle supporting pipes extending upwardly from said branch pipes and having gas burner nozzles carried thereby,

each of said branch pipes having a predetermined number of gas burner nozzles connected thereto and supplied with waste gas therefrom for combustion,



certain of said pipes being within preformed enclosures the top of which is covered by movable overlapped metal plates with notches through which said nozzle supporting pipes extend upwardly through said notches,

said branch pipes and said nozzle supporting pipes being expansible and contractible free from restraint by said plates.

4,065,249

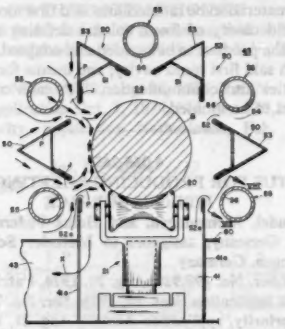
HEATER FOR BILLETS

John W. Nelson, Wyoming, Mich., assignor to Oliver Machinery Company, Grand Rapids, Mich.

Division of Ser. No. 576,596, May 12, 1975, Pat. No. 3,994,678. This application July 19, 1976, Ser. No. 706,774

Int. Cl.² F27B *9/00*

U.S. Cl. 432—8 **11 Claims**

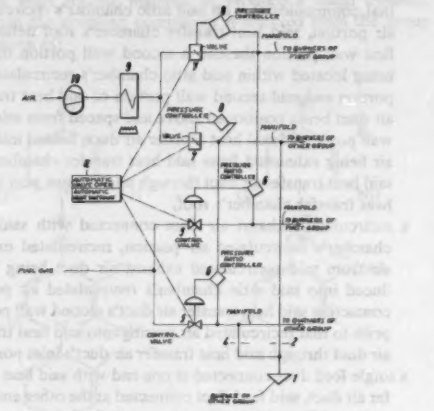


1. In a method of heating a length of material to an elevated temperature, the steps of providing a source of primary gas at a temperature at least that to which the material is to heated; providing a source of pressurized secondary gas at a temperature below that to which the material is to be heated; discharging said secondary gas through an opening against the material, the opening being of a type to create a high velocity jet-like stream; passing said jet-like stream first through a zone containing said primary gas and then through a restricted aspirating throat for entraining and accelerating quantities of said primary gas to heat the material by heat transfer to the material from a mixture of primary and secondary gases impinged upon the materials's surface.

4,065,250
METHOD OF INDEPENDENTLY ADJUSTING THE FUEL MIXTURE COMPOSITION AND MELTING RATE OF MULTIBURNER SHAFT FURNACES FOR MELTING METALS

Heinrich Schliefer, and Friedrich Wilhelm Warnecke, both of Hamburg, Germany, assignors to Norddeutsche Affinerie, Hamburg, Germany

Filed Apr. 20, 1976, Ser. No. 678,663
Claims priority, application Germany, Apr. 23, 1975, 2517957
Int. Cl.² F27D *7/00*
U.S. Cl. 432—24 **11 Claims**



1. A method of independently adjusting a fuel-mixture composition and heating rate for a multiburner shaft furnace for melting metal wherein said shaft furnace comprises at least one more group of burners, respective first manifolds for feeding air to the burners of each of said groups, respective second manifolds for feeding a fuel gas to the burners of each of said groups, and respective control valves in each of said manifolds, said method comprising the steps of:

controlling the heating rate by sensing the pressure in one of the manifolds of each of said groups of burners and operating the valve of the said one of said manifolds of each group in dependence upon the sensed pressure; and

detecting the pressure ratio between the first and second manifolds of each of said groups of burners and controlling the valve of the other manifold of the first and second manifolds of each of said groups of burners in dependence upon the detected pressure ratio with a single pressure-ratio controller, thereby adjusting the fuel-mixture compositions for the burners of said groups.

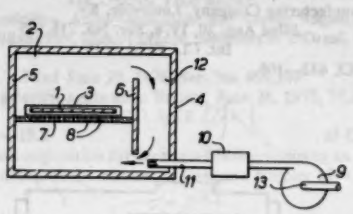
4,065,251
FURNACES

Edward Francis Beverley Croft, Aldridge, and John J. Lane, Weston-super-Mare, both of England, assignors to Associated Electrical Industries Limited, London, England

Filed Aug. 3, 1976, Ser. No. 711,236
Int. Cl.² F27B *9/28*
U.S. Cl. 432—59 **16 Claims**

1. A furnace for the heat treatment of metal strip comprising a furnace chamber with heating means

having an internal wall structure defining a flow path for gas recirculating internally within the chamber, a strip support surface extending lengthwise through the furnace chamber, a plurality of injectors in communication with a source of gas under pressure located externally of said chamber and operably connected with the furnace to place the interior of the furnace chamber under pressure to promote internal recirculation of gas within the furnace chamber and means for directing recirculating gas over the strip support surface to provide a gaseous cushion

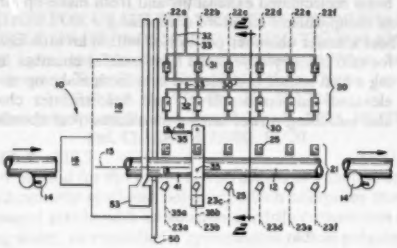


between said surface and metal strip travelling through the furnace.

4,065,252
SPRAY MIST COOLING ARRANGEMENT

Klaus H. Hemsath, Sylvania, Ohio, and Frank J. Vereecke, Palmyra, Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 480,920, June 19, 1974, Pat. No. 3,997,376.
This application May 3, 1976, Ser. No. 682,204
Int. Cl.² F27D *15/02*; B08B *3/00*
U.S. Cl. 432—77 **6 Claims**



1. Apparatus for cooling a workpiece continuously moving from a heat source into and through said apparatus, said apparatus comprising:

a framework downstream from said heat source;

a plurality of spray mist units incrementally spaced along a longitudinal axis generally parallel to the longitudinal axis of said workpiece and carried by said framework;

each mist unit including a plurality of atomizing spray nozzles spaced in generally equal increments about an imaginary boundary surrounding said workpiece at equal distances therefrom;

each nozzle being orientated within each unit to develop overlapping sprays between one another and the nozzles' spray patterns being of the type of develop overlapping sprays between adjacent mist units;

means operable to supply water and air under sufficient pressures to said nozzles

a. to produce a spray mist of atomizing water particles of size sufficient to float in air;

b. to cause turbulent flow of spray mist by said overlapping patterns prior to contacting said article and expand said mist sprays into an envelop completely surrounding that portion of the workpiece between said mist units; and

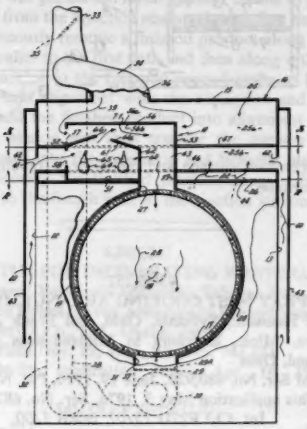
c. to evaporate said water mist particles into a water vapor before actual contact of said spray mist with the surface of said workpiece.

4,065,253

LAUNDRY DRYER

Norman J. Bullock, Prospect, Ky., assignor to W. M. Cissell Manufacturing Company, Louisville, Ky.

Filed Aug. 20, 1976, Ser. No. 716,185
Int. Cl.[2] F27B 7/36
U.S. Cl. 432—105 5 Claims



1. A laundry dryer having a hot air compartment structure that heats recirculated exhaust air and fresh make-up air, said hot air compartment structure comprising

a heat transfer chamber positioned within an attic chamber for said laundry dryer, said heat transfer chamber including a heat source provided to heat fresh make-up air to an elevated temperature level, said heat transfer chamber also including a roof having an exhaust port therein, the make-up air heated in said heat transfer chamber exhausting from said port in that chamber's roof,

make-up air duct structure connected with an inlet port to said heat transfer chamber, said make-up air duct structure directing only fresh make-up air from the atomsphere into said heat transfer chamber,

a sub-floor in said attic chamber, said sub-floor being connected with said heat transfer chamber and said attic chamber to form a recirculated air portion of said attic chamber,

a heat transfer air duct located above said heat transfer chamber, said heat transfer air duct including an inlet port that communicates with said attic chamber's recirculated air portion, said heat transfer chamber's roof defining a first wall portion thereof, a second wall portion thereof being located within said attic chamber's recirculated air portion and said second wall portion of said heat transfer air duct being positioned above and spaced from said first wall portion of said heat transfer air duct, heated make-up air being exhausted from said heat transfer chamber into said heat transfer air duct through said exhaust port in said heat transfer chamber's roof,

a recirculated exhaust air duct connected with said attic chamber's recirculated air portion, recirculated exhaust air from said recirculated exhaust air duct being introduced into said attic chamber's recirculated air portion contacting said heat transfer air duct's second wall portion prior to that recirculated air passing into said heat transfer air duct through said heat transfer air duct's inlet port, and

a single feed duct connected at one end with said heat transfer air duct, said feed duct connected at the other end with a shroud for said dryer's drum, said feed duct receiving the recirculated air flow and the make-up air flow after each has been heated, and said air flows being admixed in said feed duct prior to introduction into the dryer's drum.

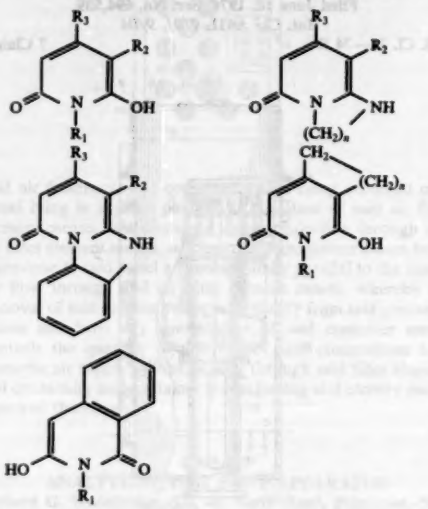
4,065,254

PROCESS FOR DYEING AND PRINTING

Arthur Bühler, Rheinfelden; Alfred Fasciati, Bottmingen, and Karl Schlumpf, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 373,216, June 25, 1973, abandoned.
This application May 19, 1976, Ser. No. 687,809
Claims priority, application Germany, June 26, 1972, 2231245
Int. Cl.[2] D06P *1/38;* C09B *27/00;* D06P *3/12*
U.S. Cl. 8—1 C 8 Claims

1. A process for dyeing and printing leather, cotton or wool material, comprising the step of applying to leather, cotton or wool material a diazonium salt and a coupling component which react on the material to produce a diazo dyestuff, wherein the coupling component is selected from the group consisting of:



wherein

R_1 is hydrogen, an alkyl group, an acylaminoalkyl group, an aralkyl group, an aryl radical, a heterocyclic radical, an alkylene radical which links the radical of the elected formula with a further similar heterocyclic radical, or an amino group;

R_2 is hydrogen, an alkyl group, cyclohexyl, cyano nitro, nitroso, H_2N—, acylamino group, an alkylcarbonyl or arylcarbonyl group, a sulphonyl group, an aminosulphonyl group, an alkoxycarbonyl or aryloxycarbonyl radical, an aminocarbonyl group, a halogen atom, a sulphoalkyl group, a haloalkanoylaminomethyl group, a quaternary ammoniumalkanoylaminomethyl group, a sulfoalkanoylaminomethyl group, a phthalimidomethyl group, an o-benzene disulfonimidomethyl group, a sulfonic acid group, a carboxyl group, a quaternized amino group, a pyridinium group or a benzimidazolium group;

R_3 is hydrogen, an alkyl group, an aralkyl radical, an aryl radical, a heterocyclic radical, the cyano group, an alkoxycarbonyl or aryloxycarbonyl radical, an aminocarbonyl group, an alkoxycarbonylmethyl or aryloxycarbonylmethyl radical, the cyanomethyl group, an acylmethyl group, an aminocarbonylmethyl group, the carboxy group or the hydroxymethyl group;

n is 2 or 3;

wherein one of R_1 and R_2 is a fiber-reactive group provided that every selected coupling component has one fiber-reactive group.

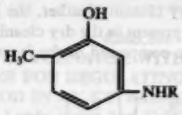
4,065,255

2-METHYL-5-N-HYDROXYALKYLAMINOPHENOL IN AN OXIDATION DYE COMPOSITION AND METHOD OF USING THE SAME

Patrick Andrillon, Aulnay-sous-Bois, and Andree Bugaut, Boulogne-Billancourt, both of France, assignors to L'Oreal, Paris, France

Filed June 23, 1976, Ser. No. 699,169
Claims priority, application France, June 26, 1975, 75.20154
Int. Cl.[2] A61K *7/13*
U.S. Cl. 8—10.2 21 Claims

1. A dye composition for keratinic fibers containing an aqueous or hydroalcoholic carrier, at least one coupler of the formula



(I)

wherein R represents hydroxyalkyl having 1–4 carbon atoms and at least one oxidation base selected from the group consisting of a paraphenylene diamine, an orthophenylene diamine, a paraamino phenol, an ortho amino phenol and a heterocyclic oxidation base, said coupler being present in an amount of 0.01 to 2.5 weight percent and said oxidation base being present in an amount of 0.01 to 3.5 weight percent, based on the total weight of said composition.

4,065,256

METHOD FOR GRAFT POLYMERIZATION OF SHAPED ARTICLE OF HYDROPHOBIC SYNTHETIC POLYMER

Kikuji Igeta, and Masakatsu Ohguchi, both of Shiga, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Feb. 2, 1976, Ser. No. 654,714
Claims priority, application Japan, Jan. 31, 1975, 50-13506
Int. Cl.[2] D06M *13/00, 13/20*
U.S. Cl. 8—115.5 23 Claims

1. A method for the graft polymerization of a shaped article of hydrophobic synthetic polymer, which comprises treating the shaped article with an aqueous emulsified dispersion containing water, an emulsifier, a hydrophobic radical polymerization initiator, an organic solvent which is liquid at normal room temperature, naphthalene and at least one unsaturated monomer containing in the molecular unit thereof at least one double bond capable of radical polymerization, the amount of naphthalene in the dispersion being from 1 to 80% by weight, based on the weight of the organic solvent,

with the proviso that when the unsaturated monomer contains an acidic group, the emulsifier is (1) a mixture of a nonionic surface active agent and an anionic surface active agent or (2) a nonionic-anionic surface active agent.

4,065,257

INHIBITION OF DYE STAINING DURING LAUNDERING OF TEXTILE MATERIALS

Gervase Coe, Stockport, and Frank Lee, Dukinfield, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 334,814, Feb. 22, 1973, abandoned.
This application July 18, 1975, Ser. No. 597,861
Int. Cl.[2] D06P *5/06*
U.S. Cl. 8—74 17 Claims

1. A method for inhibiting the dye-staining of textiles during washing comprising contacting the textile articles during the washing process with (a) a reaction product of at least three molecular proportions of an α,β-alkylene oxide with one molecular proportion of an organic compound which contains at least one basic primary or secondary amino group or a basic tertiary amino group as well as an alcoholic hydroxyl group or is an acid salt or a quaternary ammonium salt of such a reaction product, and (b) of a reaction product of an aliphatic tertiary

polyamide with an aliphatic dihalide or (b) of a reaction product of an aliphatic tertiary polyamine with an aliphatic dihalide. Wherein the proportions of (a) and (b) are each 0.25 grams per liter to 2 grams per liter of the wash water.

4,065,258

PROCESS FOR DRY CLEANING LEATHER

Haywood Gordon France, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 5, 1976, Ser. No. 664,247

Int. Cl.[2] C14C *9/00*

U.S. Cl. 8—142 **4 Claims**

1. In the process of dry cleaning leather, the improvement which comprises having present in the dry cleaning solvent an epoxy-containing silicone compound of the formula:

wherein R is an alkyl radical containing from 1 to 4 carbon atoms, R″ is an alkyl radical containing from 1 to 40 carbon atoms, R′ is an organic radical containing a vicinal epoxy group, *x* has a value of from 10 to 1,000 and *y* has a value of from 1 to 100.

4,065,259

FLUOROCARBON DYE DISPERSION FOR EXHAUST DISPERSE DYEING

Harold Leonard Jackson, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 466,844, May 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 322,126, Jan. 9, 1973, abandoned. This application Apr. 23, 1976, Ser. No. 679,905

Int. Cl.[2] D06P *5/00, 1/64;* C09B *67/00*

U.S. Cl. 8—166 **13 Claims**

1. Dye dispersion comprising:

a. an organic disperse dye; and

b. a normally liquid fluorocarbon having a fluorine to carbon atom ratio of at least 1.5, a solubility parameter of not greater than 7.0, a boiling point of at least 20°–25° C at atmospheric pressure, a critical temperature of at least 135° C. and being selected from the group consisting of

1. perfluoro(2,3-dimethylbutane), perfluorokerosene and its constituents boiling above 100° C or $(CF_3)_2CF(CF_2CF_2)_{2\text{-}4}CF(CF_3)_2$,
2. perfluorocycloaliphatic hydrocarbons,
3. chlorofluoroalkanes,
4. hydrofluoroalkanes,
5. hydrochlorofluoroalkanes,
6. perfluoroalkyl ethers,
7. hexafluoropropylene oxide polymers having a degree of polymerization of 1–50,
8. perfluoro(tri-$C_{1\text{-}12}$alkylamines) and
9. unsaturated fluorocarbons having 3–4 perfluoroalkyl groups of 1–10 carbon atoms attached to the

moiety,

each of said groups (1)–(6)having no more than 18 carbon atoms.

4,065,260

HALOGEN DERIVATIVES OF ALKYNOXYMETHYL AMINES AS CORROSION INHIBITORS

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 556,332, March 7, 1975, Pat. No. 4,026,946. This application Jan. 3, 1977, Ser. No. 756,168

Int. Cl.[2] C23F *9/00, 9/02, 11/10;* C23G *1/02*

U.S. Cl. 21—2.7 R **8 Claims**

1. A process of inhibiting metal corrosion which comprises treating an acid system with a composition which is a halogen substituted alkynoxymethyl amine.

4,065,261

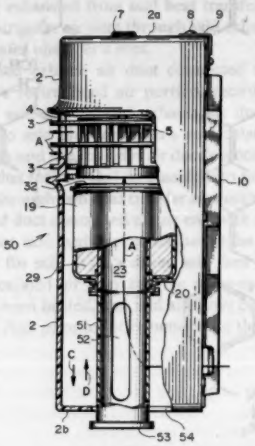
DEVICE FOR EMITTING VOLATILE SUBSTANCE

Rokuro Fukada, Ohtsu, Japan, assignor to Eikosha Co., Ltd., Kyoto, Japan

Filed June 10, 1976, Ser. No. 694,559

Int. Cl.[2] A61L *9/01, 9/04*

U.S. Cl. 21—74 R **7 Claims**



1. A device for emitting volatile substance which comprises:

a casing having a plurality of openings through which air can pass;

a motor on said casing;

a fan connected to the motor for forcing air through said openings;

a container mounted on the casing and having a pair of open ends;

a tubular adjusting member slidably mounted in one of the open ends of the container, the tubular adjusting member having an open end positioned within the container and an axially extending passage through which air can pass;

and a volatile substance within the container and outwardly of the tubular adjusting member, the adjusting member being slidable axially within said one open end of the container to vary the spacing of said open end of the adjusting member from the other open end of the container whereby the amount of volatile substance exposed to air flowing from said open end of the adjusting member can be varied.

4,065,262

FILTER AND AIR FRESHENER APPARATUS

Mitchell Petroff, 2038 Isabell, Troy, Mich. 48084

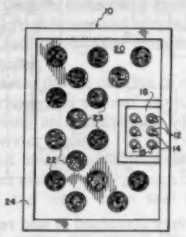
Filed Nov. 2, 1976, Ser. No. 738,051

Int. Cl.[2] A61L *9/01;* B01D *50/00*

U.S. Cl. 21—74 R **3 Claims**

1. Air filter apparatus and air freshener for filtering air and

delivering an air freshener composition to a domestic air supply comprising air filter element means for filtering air, a plurality of sealed air freshener container means positioned for holding an air freshener composition in said air filter element, each of said container means having an effluent opening and an influent opening intersected by a central axis, said central axis lying in the direction of air flow through said air filter, said air freshener container means having individual closure means thereon positioned over both and removable from at least one of said influent openings and said effluent openings for sealing said container means, said closure means being individually removable from said container means to allow air to contact



said air freshener, said container means being mounted on a panel lying in a plane parallel to the plane of said air filter element means, said container means projecting through said air filter element means, said axis of said container means being transverse to said panel and substantially parallel to the line of air flow through said air filter element means, whereby the removal of said closure means individually from said container means and from any combination of said container means controls the quantity of delivery of said composition to a domestic air supply system passing through said filter element and contacting said container means having said closure means removed therefrom.

4,065,263

ANALYTICAL TEST STRIP APPARATUS

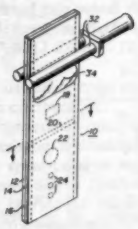
Richard G. Woodbridge, III, 40 North Road, Princeton, N.J. 08540

Continuation-in-part of Ser. No. 672,916, April 2, 1976, Pat. No. 4,007,010, and a continuation-in-part of Ser. No. 485,548, July 3, 1974, abandoned. This application June 14, 1976, Ser. No. 696,231

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.[2] G01N *27/00, 31/00, 33/00*

U.S. Cl. 23—253 TP **19 Claims**



1. An analytical test strip apparatus comprising:

at least one substantially flat strip having a front layer and a back layer, said front and back layers defining a channel therebetween through which a sample of liquid may pass, said strip also including a sample input port and a terminating end, at least one of said layers being relatively pliable;

a plurality of process station means linearly located in said channel; and,

a thin layer of an inert liquid medium located in said channel, said liquid medium adhering said two layers to each other and being strong enough to prevent the forward movement of said sample in said channel solely under the influence of gravity but weak enough to allow said sample to linearly pass in a predetermined sequence through said plurality of station means in said channel under the influence of an exterior propelling means, said liquid medium so filling said channel as to constitute the medium through which the sample is propelled, the dimensions of said liquid medium being sufficiently broad so as to substantially exclude contaminating air from said station means.

4,065,264

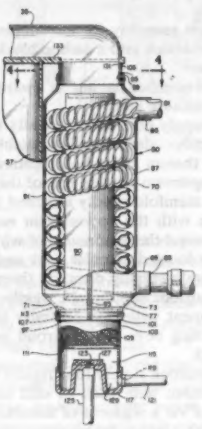
BLOOD OXYGENATOR WITH INTEGRAL HEAT EXCHANGER FOR REGULATING THE TEMPERATURE OF BLOOD IN AN EXTRACORPOREAL CIRCUIT

John Edward Lewin, Santa Ana, Calif., assignor to Shiley Laboratories, Inc., Santa Ana, Calif.

Filed May 10, 1976, Ser. No. 685,020

Int. Cl.[2] A61M *1/03;* **F28F** *1/16, 1/36;* **F28D** *7/02*

U.S. Cl. 23—258.5 BH **21 Claims**



1. A blood oxygenator having an integral heat exchanger for regulating the temperature of the blood flowing in an extracorporeal blood circuit comprising:

an oxygenating chamber;

first means for introducing blood and bubbles of oxygen into said oxygenating chamber for forming blood foam within said chamber;

second means for both (a) contributing to the transfer of oxygen into the blood and removing carbon dioxide from the blood and (b) regulating the temperature of said blood comprising a heat transfer means having a substantially continuous helical rib along its length providing a continuous helical flute passage considerably longer than the length of said heat transfer means, said helical rib being located in contact with or closely proximate to wall means of said blood oxygenator so that substantially all of said blood and blood foam produced by said first means flows in contact with external surfaces of said heat transfer means through a plurality of restricted area, extended length flow paths around the exterior of the heat transfer means provided by said helical flute passage in combination with said wall means prior to any substantial defoaming of the blood foam with a resulting relatively long residence time of the blood and blood foam in contact with said heat transfer means; and

third means coupled to said heat transfer means for supply-

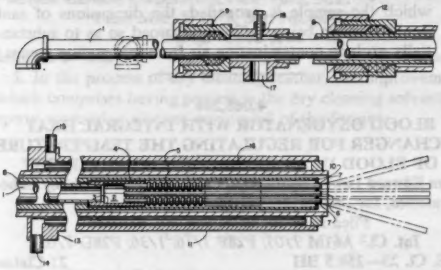
ing or removing heat energy from said heat transfer means.

4,065,265

APPARATUS FOR PRODUCING CARBON BLACK

Gary A. Chesnutt, Portland, Tex., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed June 11, 1976, Ser. No. 695,008
Int. Cl.[2] C09C *1/48*; F23C *5/06*
U.S. Cl. 23—259.5 **5 Claims**



1. An injection assembly for introducing a normally liquid hydrocarbon feedstock into a carbon black producing furnace, which comprises:

a pipe shroud member having an upstream and downstream closure end;

a feedstock supply pipe concentrically disposed within said shroud member adapted to be rotatably and longitudinally positioned therein and whose upstream end projects beyond the upstream closure end of the shroud member;

a cylindrical manifold rigidly attached to and in open communication with the downstream end of said feedstock supply pipe and the header end of which is provided with a centrally located circular port and a plurality of like ports circumferentially disposed thereabout;

a metallic feedstock supply tube rigidly connected to and in axial alignment with said centrally located circular port and projecting beyond the shroud member downstream closure end;

a metallic feedstock supply tube rigidly connected to and in axial alignment with each of said circumferentially disposed ports via a segment of metallic flex tube the combined length thereof being about that of said centrally disposed feedstock supply tube; and

a spreader plate forming the downstream rigidly affixed closure end of the shroud member and which is perforated and positioned to accommodate freely the longitudinal passage of said feedstock tubes.

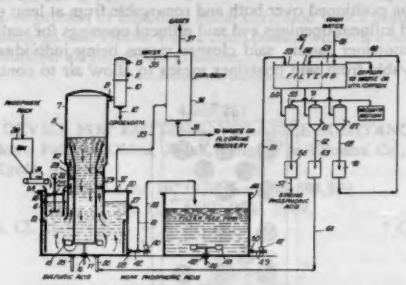
4,065,266

APPARATUS FOR MANUFACTURING PHOSPHORIC ACID

Harold B. Caldwell, Sarasota, Fla., assignor to Whiting Corporation, Harvey, Ill.

Continuation of Ser. No. 250,601, May 5, 1972, Pat. No. 3,939,248, which is a continuation of Ser. No. 779,823, Nov. 29, 1968, abandoned, which is a division of Ser. No. 632,101, April 19, 1967, Pat. No. 3,416,889, which is a continuation-in-part of Ser. No. 377,012, June 22, 1964, abandoned. This application Feb. 17, 1976, Ser. No. 658,753
The portion of the term of this patent subsequent to Dec. 17, 1985, has been disclaimed.
Int. Cl.[2] B01J *8/00*; C01F *11/46*; C01B *25/22*
U.S. Cl. 23—259.2 **6 Claims**

1. Apparatus for reacting phosphate rock and sulfuric acid in the wet process of making phosphoric acid which comprises: a reactor-cooler unit adapted to be operated with a freeboard space; a vacuum source in communication with said freeboard space; a pre-mixer in which phosphate rock is combined with a liquid to form a slurry prior to being introduced into said reactor-cooler unit, slurry conduit means connecting said pre-mixer with said reactor-cooler unit; and, means for introducing sulfuric acid into said reactor-cooler unit; said reactor-cooler unit comprising an enclosed vessel, flow directing means within said enclosed vessel, forced circulation means operatively associated with said flow directing means for circulating



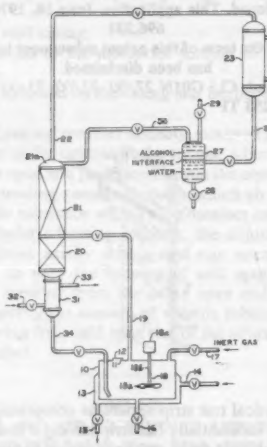
a body of reaction slurry contained in said reactor-cooler unit in a flow pattern adapted to expose substantially the entire body of said reaction slurry to a subatmospheric pressure maintained in said freeboard space at a rate sufficient to provide substantially uniform conditions of temperature and concentration throughout said body of reaction slurry, and outlet means in said vessel for withdrawing reaction slurry from said reactor-cooler unit.

4,065,267

MANUFACTURE OF ALKYLATED UREA OR MELAMINE FORMALDEHYDE WITH IN-PROCESS ALCOHOL RECOVERY

Lawrence Ladage, Muskego, Wis., and Hilary E. Holste, Lower Burrell, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 541,744, Jan. 17, 1975. This application Sept. 13, 1976, Ser. No. 722,979
Int. Cl.[2] B01D *3/00*
U.S. Cl. 23—263 **3 Claims**



1. An apparatus for preparing alkylated urea or melaimine formaldehyde resins from an alcohol having a boiling point higher than the boiling point of water comprising:

a. reactor having heat and agitating means;

b. a fractionating column having at least one theoretical plate of separation, and having a rectifying section above a stripping section;
c. first conduit means for passing a mixture of said alcohol and water vapor from said reactor to the junction of the rectifying section and stripping section of said column;
d. reboiler means connected to the bottom of said column, said reboiler having controls adapted to maintain a temperature below the boiling point of said alcohol;
e. second conduit means connecting said reboiler and said reactor and adapted to return alcohol from said reboiler to said reactor;
f. a condenser having coolant circulating means;
g. third conduit means connecting rectifying section of said column to said condenser and adapted to pass a mixture of said alcohol and water vapor from said rectifying section to said condenser;
h. a phase separator device capable of separating an alcohol phase comprising said alcohol from a water phase, said separator having an outlet at the bottom thereof for removing the water phase;
i. fourth conduit means connecting said phase separator to said condenser and adapted to pass a condensed mixture of said alcohol and water from said condenser into said separator;
j. fifth conduit means connecting the top portion of said phase separator to the top portion of said column and adapted to pass the alcohol phase from said separator into the top portion of said column.

4,065,268

NON-UNIFORM CRIMPED METAL RIBBON PACKED CATALYST BED AND METHOD USING SAME

Erwin C. Betz, 524 Mill Vallye Road, Palatine, Ill. 60067

Filed Sept. 15, 1975, Ser. No. 613,544
Int. Cl.[2] B01J *8/00, 35/06*
U.S. Cl. 23—288 F **11 Claims**

1. A catalyst bed packed with catalytically active crimped metal ribbon wherein a substantial proportion of at least two different crimp configurations are present.

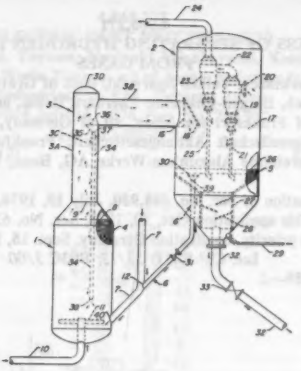
4,065,269

SPENT CATALYST REGENERATION APPARATUS

Richard P. Pulak, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 429,422, Dec. 28, 1973, Pat. No. 3,953,175. This application Apr. 12, 1976, Ser. No. 676,254
The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.
Int. Cl.[2] B01J *8/08, 8/18, 37/14*
U.S. Cl. 23—288 B **7 Claims**

1. An apparatus for oxidizing coke on spent catalyst which apparatus comprises in combination:
a. a spent-catalyst-regenerated-catalyst admixture receiving chamber for containing a dense-phase fluidized bed of catalyst having a spent-catalyst-regenerated-catalyst admixture inlet means and a fresh-regeneration-gas inlet means connected thereto to allow passage of a spent-catalyst-regenerated-catalyst admixture and fresh regeneration gas respectively into said chamber and having a regenerated-catalyst/regeneration-gas outlet means connected thereto to allow passage of regenerated catalyst and spent-regeneration gas from said chamber;
b. a spent-catalyst-regenerated-catalyst admixture conduit connected to said spent-catalyst-regenerated-catalyst admixture receiving chamber inlet means;
c. a transfer conduit having a substantially vertical portion and a substantially horizontal portion, said vertical portion having an inlet connected to said regenerated-catalyst/regeneration-gas outlet means and said horizontal portion extending into the side of a hereinafter described regenerated-catalyst receiving chamber and having an outlet within said chamber whereby said regenerated catalyst and regeneration gas are carried from said spent-catalyst-regenerated-catalyst admixture receiving chamber in admixture to said regenerated-catalyst receiving chamber;
d. a regenerated-catalyst receiving chamber for containing a dense-phase bed of regenerated catalyst, said chamber having a regenerated-catalyst outlet means and a spent-regeneration-gas outlet means connected thereto to allow passage of said regenerated catalyst and said spent regeneration gas from said chamber and said chamber being



adjacent to and at an elevation with respect to said spent-catalyst-regenerated-catalyst admixture receiving chamber to maintain at least a portion of said dense-phase bed of said regenerated catalyst above said dense-phase fluidized bed of catalyst in said spent-catalyst-regenerated-catalyst admixture receiving chamber; and,
e. an external regenerated-catalyst recycle means, external from said spent-catalyst-regenerated catalyst admixture receiving chamber, having an inlet means in said regenerated-catalyst receiving chamber and an outlet means in said spent-catalyst-regenerated-catalyst admixture conduit, to allow passage of a portion of said regenerated catalyst from said regenerated-catalyst receiving chamber in admixture with spent catalyst in said spent-catalyst conduit to said spent-catalyst-regenerated catalyst admixture receiving chamber.

4,065,270

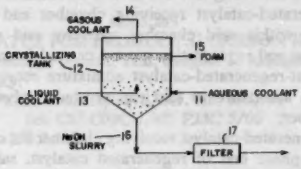
PROCESS FOR PURIFYING SODIUM HYDROXIDE

Keiichi Nakaya, Chiba; Suekazu Hirata, and Kunio Sato, both of Ichihara, all of Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1976, Ser. No. 677,754
Int. Cl.[2] B01D *9/02;* **C01D** *1/30*
U.S. Cl. 23—299 **17 Claims**

1. A process for purifying sodium hydroxide which comprises:
cooling an aqueous solution of sodium hydroxide containing soluble impurities to form a slurry containing sodium hydroxide hydrate crystals and the fine impurity crystals;
forming bubbles in said slurry, whereby said impurity crys-

tals are adsorbed on the bubbles and float upward therewith to form a foamed scum on said slurry; and



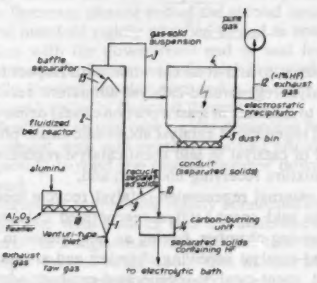
removing said scum from said slurry, thereby separating the impurity crystals from the sodium hydroxide crystals.

4,065,271

PROCESS OF SEPARATING HYDROGEN FLUORIDE FROM GASES

Ernst Weckesser; Volker Sparwald, both of Grevenbroich; Lothar Reh, Bergen-Enkheim; Eberhard Bohm, and Rolf Graf, both of Frankfurt am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Vereinigte Aluminium-Werke AG, Bonn, both of, Germany

Continuation of Ser. No. 488,930, July 19, 1974, abandoned. This application Oct. 10, 1975, Ser. No. 621,604
Claims priority, application Germany, Sept. 15, 1973, 2346580
Int. Cl.² B01D *53/12*; B03C *3/00*
U.S. Cl. 55—2 **7 Claims**



1. A process for removing hydrogen fluoride from a gas which comprises the combination of the following steps:

a. introducing the gas into a fluidized bed reactor at a velocity of 1 to 5m/sec calculated for the empty reactor to form a gas-solid suspension in which the solids concentration decreases from bottom to top and wherein the solids have a particle size of 20 to 300 microns;

b. extracting solids from said reactor substantially exclusively in an upward direction by entrainment with gas in a gas-solid suspension having a solids content of the order of 175 to 250 grams per cubic meter (STP) of the extracted suspension;

c. separating the solids extracted in step (b) from the entraining gas without prior removal of the solids from the gas-solid suspension which has a dust resistivity adjusted to be below 10^{12} Ohm-cm by means of an electrostatic precipitator directly following the reactor and constituting the sole gas/solid separator downstream of the reactor;

d. simultaneously with the separation of the solids from the entraining gas classifying the separated particles of the solids in said electrostatic precipitator into fine-grain and coarse-grain fractions;

e. recycling the coarse-grain fraction into the fluidized bed reactor to form a circulating fluidized bed therein while discharging the fine-grain fraction upon which impurities in said gas preferentially adsorb; and

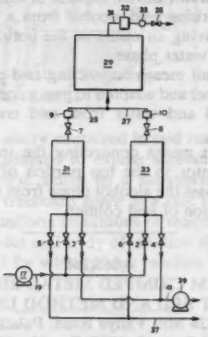
f. discharging gas from said electrostatic precipitator after the separation of said particles therefrom as an exhaust gas containing at most about 1 mg/m³ (STP) of fluorine as HF.

4,065,272

OXYGEN-ENRICHED AIR

John Walter Armond, Great Bookham, England, assignor to BOC International Limited, London, England

Filed Dec. 30, 1975, Ser. No. 645,316
Claims priority, application United Kingdom, Jan. 2, 1975, 98/75
Int. Cl.² B01D *53/02*
U.S. Cl. 55—25 **8 Claims**



1. A process for producing oxygen-enriched air for respiration which comprises the sequential steps of passing air under superatmospheric pressure in a first direction into an inlet end of a unitary bed of an adsorbent that preferentially adsorbs at least moisture and nitrogen, and collecting an oxygen-enriched product gas from an outlet end of the bed in a reservoir at superatmospheric pressure, passing oxygen-enriched product gas from the reservoir through a pressure regulator to reduce the product gas pressure to a predetermined value for delivery for end use, regenerating the bed by venting the bed to atmospheric pressure in a direction counter-current to that of the superatmospheric pressurized air introduction in the first direction, evacuating the bed in the said counter-current direction to below atmospheric pressure, regulating the venting and the evacuating of the bed by utilization of selected differential pressures so that at the inlet end of the bed the actual volume of gas withdrawn during the venting and the evacuating exceeds the actual volume of superatmospheric pressure air fed into the inlet end of the bed in the first direction, backfilling the bed in said counter-current direction to generally atmospheric pressure by introducing product-quality gas from a source at superatmospheric pressure, whereby the regeneration of the bed is enhanced by moving residual gaseous material in the bed closer to the inlet end of the bed to thereby enhance desorption of adsorbent at the outlet end of the bed.

4,065,273

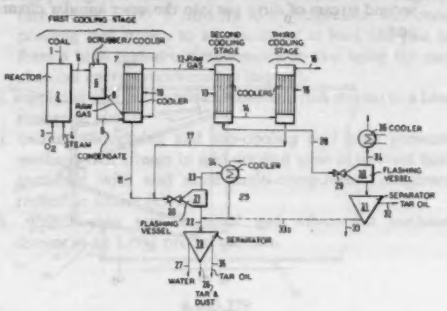
PROCESS FOR BREAKING EMULSIONS IN A TAR-CONTAINING AQUEOUS CONDENSATE

Paul Rudolph, Bad Homburg, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 4, 1976, Ser. No. 663,880
Claims priority, application Germany, Sept. 30, 1975, 2543532
Int. Cl.² B01D *47/00*
U.S. Cl. 55—50 **5 Claims**

1. Separation process for removing tar from water in a condensate formed by the cooling of a raw gas produced by the gasification of coal with oxygen and water vapor under a

pressure of 20–80 bars, which comprises treating said raw gas in a scrubbing and cooling zone and withdrawing said condensate, enriching said condensate with at least one member of the



group consisting of ammonium carbonate and ammonium bicarbonate to a concentration of at least 5 grams NH_3 per kg H_2O, and separating tar from said condensate in a separation zone.

4,065,274

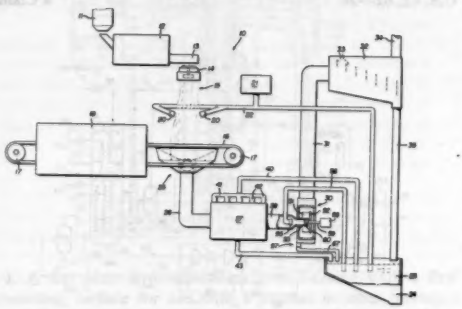
METHOD AND APPARATUS FOR REMOVING PARTICULATE POLLUTANTS FROM STACK GASES

Roland E. Langlois, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 532,264, Dec. 12, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,444

Int. Cl.² B01D *47/16*

U.S. Cl. 55—89 **17 Claims**



1. A method of removing fine particulate contaminants from a stream of process air comprising the steps of passing the stream of process air through a centrifugal fan having a fan inlet, injecting at least 1.5 gallons per minute of wash water into the inlet for each one thousand standard cubic feet per minute of process air flowing therethrough to break the volume of wash water into droplets and thoroughly wet the fan rotor and the interior of the fan housing, agglomerating the particulates into composite masses of substantially greater size and mass due to particlewater contact during the passage of the process air through the fan, forcing the wash water and at least a portion of the agglomerated composite masses to flow toward and travel along the inside surface of the outside wall of the fan housing, impinging the wash water and composite masses on a deflection member interposed into the path of travel along the inside surface of the outside wall of the fan housing to divert the flow of said wash water and composite masses through a discharge slot and out of the fan housing, and draining the diverted wash water and said at least a portion of the agglomerated composite masses away from the fan housing.

5. In a centrifugal fan assembly for separating particulate pollutants from a stream of process gas, said fan having a housing, rotary mounted radial fan blades, an inlet to feed said process gas into said fan, a spray means for injecting at least 1.5 gallons per minute of water through said fan inlet for each one thousand standard cubic feet per minute of process gas passing therethrough to break up said water into droplets thoroughly wetting the fan rotor and housing components for agglomerating said particulates into larger masses by particle-water contact for inertia-separation, the improvement comprising stripping means interposed at least partially into the interior of said housing and across substantially the entire width thereof for utilizing the kinetic energy of said water as it travels along the interior surface of said housing to positively expel the water and the agglomerated particulates contained therein from the interior of the fan housing.

4,065,275

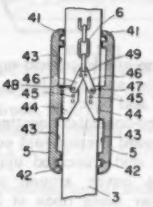
ELECTRIC DUST PRECIPITATOR

Yosio Kikuchi, Toyama; Noriyuki Miyabayashi, Kosugimachi, and Masao Wada, Toyama, all of Japan, assignors to Nippon-kai Heavy Industries Co., Ltd., Toyama, Japan

Filed July 16, 1976, Ser. No. 705,935

Int. Cl.² B03C *3/74*

U.S. Cl. 55—121 **13 Claims**



1. An electric dust precipitator comprising;

a pair of groups of dust-collecting electrodes disposed in parallel with each other in a chamber having a gas inlet and gas outlet;

a plurality of discharging wires disposed in parallel with and between said dust-collecting electrode groups, with a high direct current voltage being applied to said discharging wires and to said dust-collecting electrodes;

a horizontal scraping means being positioned around each of said groups and which includes a pair of sliding bars adapted to slide along opposite surfaces of said electrodes and having opposed brackets at the inside thereof, and a pair of drawing plates, one end of each of said drawing plates being pivotally connected to said brackets, and the other end of each of said drawing plates being commonly suspended by a chain;

and a winding means mounted above the top of said electrode groups for retracting said chain.

4,065,276

AIR-CLEANER

Akira Nakaya, and Haruyoshi Maruyama, Akashi, both of Japan, assignors to Akashi Factory, Kawasaki Heavy Industries, Ltd., Akashi, Japan

Filed Apr. 1, 1976, Ser. No. 672,715

Claims priority, application Japan, Apr. 14, 1975, 50-51074

Int. Cl.² B01D *25/04*

U.S. Cl. 55—276 **1 Claim**

1. An air cleaner which isolates the pulsation of inspiratory pressure from an internal combustion engine, said air cleaner comprising:

a hollow air cleaner housing having an inlet opening thereinto and an outlet opening therefrom, said outlet opening

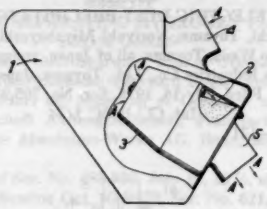
being connected to the induction system of said internal combustion engine;

a vibration-isolating cover removeably positioned within said air cleaner housing, said cover comprised of:

a cylindrical lower portion completely open at the top thereof and having an outlet opening in the bottom thereof fitted over said outlet opening of said air cleaner housing, and

a truncated, conical upper portion completely open at the bottom thereof and removeably fitted over said open top of said lower portion, the narrower upper portion thereof having an inlet opening through the top surface thereof aligned with said outlet opening through said lower portion;

a truncated conical support being narrower at the top than at the bottom, said conical support further having perforated sidewalls and being positioned within said lower portion at the bottom thereof over said outlet opening ;



a bolt fixed to the top of said conical support and extending upwardly therefrom and a nut being threaded to the top projecting end of said bolt;

an inverted, truncated conical connecting spider fixed to and projecting downward toward said conical support from the underside of said truncated upper portion of said vibration-isolating cover around said inlet opening therein, said spider being open at the portion thereof adjacent said inlet opening, said spider further having a hollow guide post through the conical portion thereof surrounding said upwardly projecting bolt;

a support plate connected to the bottom end of said spider and surrounding said bolt and extending radially beyond the top of said conical support;

a hollow, conical and truncated air cleaner element postioned between said support plate and the bottom of said cylindrical lower portion of said vibration-isolating cover, surrounding said conical support and spaced substantially along the entire length thereof from the sidewalls of said vibration-isolation cover.

4,065,277

INLET FOR CYCLONE-TYPE PARTICULATE MATTER GAS SEPARATOR DEVICE

Francis E. Dahlem, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

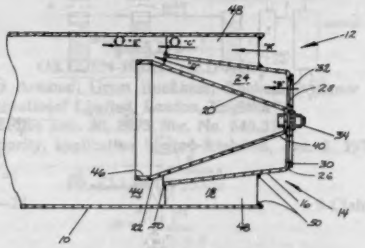
Filed Aug. 13, 1976, Ser. No. 714,110
Int. Cl.[2] B01D *51/00, 45/12*
U.S. Cl. 55—418 **10 Claims**

1. In a cyclone particulate matter gas separator of the type having a generally cylindrical housing having an inlet opening at one end for the ingress of a dirty gas stream to be cleaned, the improvement which comprises:

first means cooperating with the housing at the inlet opening thereof to define an outer annular channel converging in a generally axial direction of the housing from the exterior to the interior of the housing for directing a first stream of dirty gas into the housing and accelerating the first stream of dirty gas;

second means cooperating with the first means to define an inner annular channel concentrically disposed with the outer annular converging channel and converging in a generally axial direction of the housing from the exterior to the interior of the housing for directing a second stream of dirty gas into the housing and accelerating the second stream of dirty gas;

means for adjustably varying the volume rate of flow of the second stream of dirty gas into the inner annular channel; and,



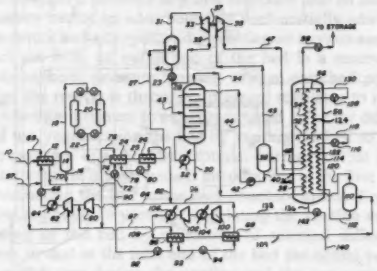
gas flow directing means disposed within the outer annular channel for imparting a whirling motion to the first gas stream flowing through the outer annular channel from the exterior to the interior of the housing.

4,065,278

PROCESS FOR MANUFACTURING LIQUEFIED METHANE

Charles L. Newton, Bethlehem, and Lee S. Gaumer, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 2, 1976, Ser. No. 673,162
Int. Cl.[2] F25J *3/02*
U.S. Cl. 62—26 **4 Claims**



1. A liquefaction process for liquefying a natural gas feed stream comprising the steps of:

a. supplying said natural gas feed stream at a pressure at or above 860 psia,

b. cooling said feed stream in a plurality of heat exchange zones in indirect heat exchange with a refrigerant in a separate, closed loop refrigeration system,

c. isentropically expanding said feed stream to a first pressure which is below the critical pressures of both the overhead and bottom streams found in subsequent step (d) and thereby obtaining mechanical energy,

d. fractionating the expanded feed stream in a scrub column to form an overhead stream rich in methane and a bottom stream rich in heavy hydrocarbons,

e. cooling and partially condensing said overhead stream in indirect heat exchange with a multi-component refrigerant in a separate, closed loop refrigeration system,

f. phase separating said partially condensed overhead stream into a liquid fraction rich in heavy hydrocarbons and a methane-rich vapor stream,

g. supplying said liquid fraction to said scrub column as reflux,

h. supplying said methane-rich vapor stream at a temperature below −100° F directly to a compressor, and compressing said stream to a pressure of at least 680 psia to form a high pressure methane-rich stream using the mechanical energy recovered in step (c),

i. supplying said high pressure methane-rich stream to a heat exchange zone,

j. cooling, liquefying and sub-cooling said high pressure methane-rich stream in said cooling zone in indirect heat exchange with said same multi-component refrigerant recited in clause (e), and

k. withdrawing said liquefied and sub-cooled methane stream as an LNG product stream.

4,065,279

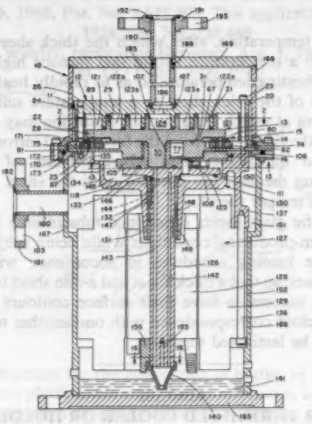
SCROLL-TYPE APPARATUS WITH HYDRODYNAMIC THRUST BEARING

John E. McCullough, Carlisle, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Sept. 13, 1976, Ser. No. 722,695

Int. Cl.² F25B *1/04*; F16C *17/04*; F01C *1/02*; F04C *17/02*

U.S. Cl. 62—510 **25 Claims**



1. A flat plate hydrodynamic thrust bearing with a first contacting surface for use with a journal member having a second contacting surface which is driven to define an orbiting motion, characterized in that one of said contacting surfaces has intersecting groovings for carrying an oil lubricant, the pattern of said groovings being such that when said second surface undergoes said orbiting motion all points on the other of said contacting surfaces intersect a sufficient number of said groovings to ensure that said contacting journal and bearing surfaces are lubricated with a thin, essentially continuous film of said oil lubricant.

4,065,280

CONTINUOUS PROCESS FOR MANUFACTURING OPTICAL FIBERS

Charles K. Kao; James E. Goell, and Mokhtar S. Maklad, all of Roanoke, Va., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 16, 1976, Ser. No. 751,282

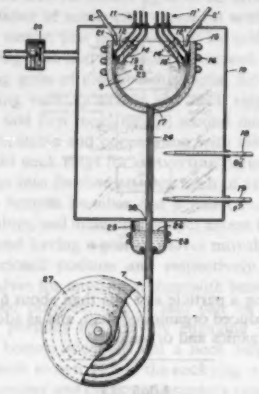
Int. Cl.² C03B *37/02*

U.S. Cl. 65—3 A **12 Claims**

1. A continuous process for manufacturing optical fibers comprising the steps of:

depositing glass by a chemical vapor reaction onto at least one crucible having an orifice;

heating the crucible in order to melt the glass;



drawing the glass through the orifice into a fiber; and

coating the fiber with a plastic cladding.

4,065,281

PRODUCTION OF AMBER GLASS

Robert Edward Byrne, Martinsville, N.J., assignor to Research-Cottrell, Bound Brook, N.J.

Filed May 5, 1976, Ser. No. 683,328

Int. Cl.² C03B *5/16*; C03C *13/00*

U.S. Cl. 65—19 **1 Claim**

1. A method of producing amber soda-lime glass by a fusion process of

Sand: 22.8
Soda Ash: 8.0
Potassium Carbonate: 2.3
Sodium Nitrate: 2.1
Lime: 3.0
Feldspar: 1.6
Borax: 0.5
Antimony: 0.1

plus iron oxide Fe_2O_3 to the desired color, the improvement comprising substituting at least one percent of the silica content of the sand, lime and feldspar of the batch with lignite fly ash.

4,065,282

METHOD OF RECOVERY OF GLASS FROM MUNICIPAL WASTE

Booker W. Morey, Pasadena, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

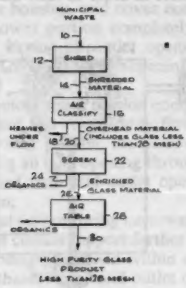
Continuation of Ser. No. 621,525, Oct. 10, 1975, abandoned, which is a continuation of Ser. No. 464,798, April 29, 1974, abandoned. This application Mar. 15, 1977, Ser. No. 777,653

Int. Cl.² C03B *1/00*

U.S. Cl. 65—28 **17 Claims**

1. In a process for the recovery of glass from municipal waste, including the steps of shredding said waste, subjecting said shredded waste to treatment in an air classifier, recovering a portion of the resulting air classified shredded waste containing glass, and subjecting said recovered portion of shredded waste to treatment on an air table; the improvement which comprises the steps of recovering the overhead material including glass from said air classifier, said air classifier being operated under conditions such that the glass contained in said overhead material has a particle size smaller than about 6 mesh, screening said overhead material obtained from said air classifier, recovering a screened material enriched in glass and sub-

jecting said screened material to treatment on an air table and recovering as first product a material consisting essentially of



fine glass having a particle size less than about 6 mesh and of substantially reduced organics content, and as additional products other inorganics and organics.

4,065,283

METHOD FOR MAKING A GLASS-BASED SOFT-EDGED APERTURE FILTERS

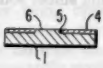
Yoshijuki Asahara, Kawasaki, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 668,999

Claims priority, application Japan, Mar. 22, 1975, 50-34613; May 20, 1975, 50-60061

Int. Cl.[2] C03C *15/00*; C03B *11/08*; C03C *19/00*

U.S. Cl. 65—30 E **9 Claims**



1. A method for producing a soft edged aperture filter to prevent Fresnel diffraction at the edge of a glass rod which comprises diffusing a coloring element into a glass plate which has on a first surface thereof a glass projection portion which does not extend to any side of the glass plate, wherein said diffusion is into the projection and into said first surface and bottom surface of the plate, and subsequently removing said glass projection portion down to said first surface having said diffused coloring element without disturbing said first surface and removing the diffused bottom surface to thereby provide a light transmittance gradient arranged in a circle on the glass plate, the gradient being a lowering of the light transmittance between the first and second surfaces of the glass plate in the radial direction from the inner to the outer portion of the circle.

4,065,284

METHOD OF TEMPERING GLASS SHEETS OF UNEQUAL THICKNESS

Raymond L. Mang, and Thomas W. Carr, both of Huntsville, Ala., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 1, 1977, Ser. No. 773,356

Int. Cl.[2] C03B *27/00*

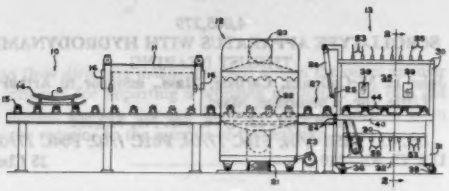
U.S. Cl. 65—114 **4 Claims**

1. A method of tempering glass sheets of unequal thickness so as to maintain their surface contours in close correspondence with one another, comprising the steps of:

placing a relatively thin sheet of glass into a furnace which includes an array of heating means, within which the thin sheet is first subjected to a preheating temperature slightly lower than a temperature suitable for tempering so as to substantially avoid distorting the glass sheet surfaces for a period of time sufficient to heat the thin glass sheet throughout its thickness to approximately said preheating temperature, after which the thin sheet is subjected to a temperature within said furnace higher than said preheating temperature so as to rapidly heat surface portions of the thin sheet to a temperature suitable for tempering at which glass surface distortion may occur;

removing the thin sheet from the furnace and introducing it into a quenching zone wherein blasts of cooling tempering medium are directed onto the sheet so as to impart a temper thereto;

in close succession to the treatment of the thin sheet, placing a relatively thick sheet of glass into said furnace, within which the thick sheet is first subjected to said preheating temperature for a period of time sufficient to heat the thick sheet throughout its thickness to approximately said pre-



heating temperature, after which the thick sheet is subjected to a temperature within said furnace higher than said preheating temperature so as to rapidly heat surface portions of the thick sheet to a temperature suitable for tempering at which glass surface distortion may occur;

removing the thick sheet from the furnace and introducing it into said quenching zone wherein blasts of cooling quenching medium are directed onto the sheet so as to impart a temper thereto;

whereby the glass sheets experience substantially identical distortion-producing conditions while being subjected to disparate heating schedules in accordance with their thicknesses, so that a thick sheet and a thin sheet tempered in close succession have their surface contours in sufficiently close correspondence with one another to permit them to be laminated together.

4,065,285

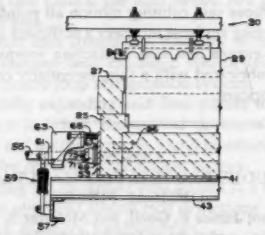
SEAL FOR THRESHOLD COOLER OR HOLDDOWN MEMBER OF A FLOAT GLASS TANK

George A. Pecoraro, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 26, 1976, Ser. No. 670,609

Int. Cl.[2] C03B *18/02*

U.S. Cl. 65—182 R **4 Claims**



1. In an apparatus for making flat glass comprising a glass-making furnace connected to a glass forming chamber through a molten glass delivery facility wherein

the forming chamber includes an impervious metal casing having an inner refractory liner containing a pool of mol-

ten metal for supporting glass during forming and the delivery facility includes a refractory threshold for supporting molten glass during its delivery to the forming chamber with the threshold being at least partially disposed inside the casing between side casing plates and having at least one thermal control member extending completely through a transverse opening in the threshold and through openings in the side casing plates of the casing

the improvement which comprises a compression fitted seal disposed around each end portion of the thermal control member and the seals held against outer exposed faces of the side casing plates on both sides of the delivery facility with sufficient force to compress against the refractory threshold for completely sealing the transverse opening through the threshold from communication with gases surrounding the delivery facility.

4,065,286

MACHINE FOR THE PRODUCTION OF CONTAINERS OR THE LIKE OF VITREOUS MATERIAL

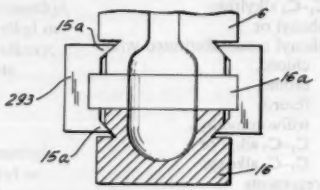
Kurt Becker, Obernkirchen, Germany, assignor to Hermann Heye, Obernkirchen, Germany

Continuation-in-part of Ser. No. 438,347, Jan. 31, 1974, abandoned, which is a division of Ser. No. 197,075, Nov. 9, 1971, Pat. No. 3,803,877, which is a division of Ser. No. 716,196, March 26, 1968, Pat. No. 3,622,305. This application Sept. 22, 1976, Ser. No. 725,445

Claims priority, application Germany, Apr. 1, 1967, 62338

Int. Cl.[2] C03B *9/00, 9/40*

U.S. Cl. 65—229 **16 Claims**



1. In a machine for the production of bottles or like hollow articles from plasticizable material, a combination comprising a mold construction including an upright bottom member, an annular neck ring located above and spaced from said bottom member and having an opening located substantially on a common axis with said bottom member, gripper means having a pair of halves movable between an open and a closed position, and a pair of mold center part halves carried by said gripper means between said neck ring and said bottom member movable with said two halves of said gripper means between said open and said closed position to define in said closed position with said neck ring and said bottom member a cavity of said mold, one of said pair of halves having opposite end portions respectively engaging in said closed position said neck ring and said bottom member and shaped to center said neck ring and said bottom member with respect to said center part, said halves of said gripper means being mounted for pivotal movement about a pivot axis parallel to said common axis; and means for moving said halves of said gripper means about said pivot axis between said open and said closed position.

5. In a machine for the production of bottles or like hollow articles from plasticizable material, a combination comprising a first turntable turnable about a first vertical axis and carrying a plurality of circumferentially spaced first mold means movable with said first turntable about said first vertical axis; a second turntable spaced from said first turntable and turnable about a second vertical axis, said second turntable carring a plurality of circumferentially spaced second molds means for movement with said second turntable about said second vertical axis; endless conveyor means extending between and encircling a portion of each turntable for movement in synchronism therewith; a plurality of neck rings carried by said conveyor means spaced therealong in correspondence with the spacing of said mold means on said turntables so as to be brought by movement of the latter in substantial alignment with said first and second mold means; first means carried by said first turntable and cooperating with said first mold means and said neck rings for converting gobs of plasticized material fed thereinto into parisons having ends located in the neck rings respectively aligned with said first mold means; second means carried by said second turntable and cooperating with said second mold means and said neck rings for converting parisons carried by said neck rings into finished articles; each of said mold means comprising a bottom member and a pair of complementary center part halves, and including gripper means for each of said mold means and having a pair of halves movable between an open and a closed position and respectively carrying said center part halves for movement therewith between said open and said closed position, one of said pair of halves having opposite end portions respectively engaging in said closed position said bottom member and a neck ring substantially aligned therewith so as to center the neck ring with the respective bottom member and the complementary center part halves along a common axis, said halves of said gripper means being mounted for movement about a pivot axis parallel to said common axis; and means for moving said halves of said gripper means about said pivot axis between said open and said closed position.

4,065,287

METHANOL TREATED ACTIVATED SLUDGE AS AN AGRICULTURAL CHEMICAL CARRIER

William B. Roth, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 17, 1976, Ser. No. 697,174

Int. Cl.[2] C05F *3/00*

U.S. Cl. 71—13 **17 Claims**

1. An agricultural composition comprising:

a. an agricultural chemical selected from the group consisting of pesticides, fertilizers, insect attractants, and insect repellants, wherein said chemical is present in an amount ranging from about 0.001% to about 50% by weight of said composition;

b. methanol treated activated sludge (MAS) solids in an amount of from about 0.006% to about 2.5% by weight of said composition; and

c. a solvent.

4,065,288

NOVEL 2-CHLOROETHANE-(THIONO)-PHOSPHONIC ACID AMIDO COMPOUNDS AND PLANT GROWTH INHIBITING COMPOSITIONS

Wolfgang Hofer, Wuppertal-Vohwinkel; Reinhard Schliebs, Cologne; Robert Schmidt, Leverkusen, and Ludwig Eue, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

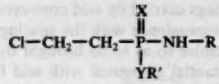
Continuation of Ser. No. 413,134, Nov. 5, 1973, abandoned, which is a division of Ser. No. 119,912, March 1, 1971, Pat. No. 3,825,635. This application Oct. 28, 1975, Ser. No. 626,514

Claims priority, application Germany, Mar. 4, 1970, 2010119

Int. Cl.[2] A01N *5/00*

U.S. Cl. 71—76 **15 Claims**

1. Plant growth inhibiting composition comprising an inert plant growth regulatingly acceptable carrier, and as an active ingredient, an effective amount of a 2-chloroethane-(thiono)-phosphonic acid amido compound of the general formula



in which
X and Y, which may be the same or different, are oxygen or sulfur,
R is hydrogen or iso-propyl, and
R′ is alkyl of form 1 to 4 carbon atoms, or, if R is hydrogen and Y is sulfur,
R′ may additionally be phenyl which may be substituted by up to two chlorine atoms.

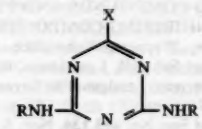
4,065,289

METHOD OF MAKING SOLID FERTILIZER HERBICIDE GRANULES

David John Judd, St. Albans, England, assignor to Murphy Chemical Limited, St. Albans, England

Continuation of Ser. No. 164,461, July 20, 1971, abandoned. This application Sept. 12, 1973, Ser. No. 396,404
Claims priority, application United Kingdom, July 24, 1970, 36111/70; July 12, 1971, 36111/71
Int. Cl.[2] A01N *13/00*
U.S. Cl. 71—82 **11 Claims**

1. A method of making a plant fertilizer-herbicide composition which comprises:
a. making a dry mixture of 1 to 100 parts by weight of a plant fertilizer component (A) selected from the group consisting of urea, ammonium nitrate, ammonium sulphate, ammonium chloride, ammonium phosphate, calcium nitrate, sodium nitrate, potassium nitrate, urea-aldehyde condensates, methylene ureas and mixtures thereof with ammonium phosphate, potassium nitrate, potassium phosphate, potassium sulphate, and potassium chloride; and 1 part by weight of a herbicide component (B) having a melting or softening point below 145° C and below that of component (A) when mixed therewith, said component (B) also having a solubility in water not exceeding 1g/liter at 20° C; wherein said herbicide component is selected from the group consisting of 2-tert-butyl-4,6-dinitro-5-methylphenyl acetate, 2-tert-butyl-4,6-dinitro-phenyl acetate, 2-tert-butyl-4,6-dinitrophenyl ethyl fumarate, 3-(4-bromo-3-chlorophenyl)-1-methoxy-1-methylurea, 3-(4-chlorophenyl)-1-methoxy-1-methylurea, isopropyl N-phenylcarbamate, 2-chloro-N-isopropyl-acetanilide, and a triazine herbicide of the general formula:



wherein X is OR or SR, the R groups being the same or different lower alkyl groups;
b. thereafter extruding the dry mixture through a die at a temperature of 70° to 145° C whereby said herbicide component acts as a lubricant to permit ready extrusion of said fertilizer component in solid form and subsequently solidifies to bind said fertilizer component into a coherent extrudate.

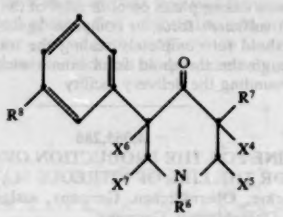
4,065,290

HERBICIDAL β-PHENYL-4-PIPERIDINONES

Harold Mellon Taylor, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

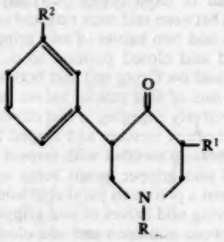
Continuation-in-part of Ser. No. 593,095, July 3, 1975, abandoned. This application May 20, 1976, Ser. No. 685,409
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—94 **17 Claims**

1. A method of reducing the vigor of unwanted herbaceous plants which comprises contacting the plants with a herbicidally-effective amount of a compound of the formula



wherein
R^6 represents C_1–C_3 alkyl, C_2–C_3 alkenyl or propargyl;
R^7 represents
hydrogen,
phenoxy,
phenylthio,
C_1–C_4 alkyl,
C_1–C_4 alkoxy,
C_1–C_4 alkylthio,
phenyl or
phenyl monosubstituted with
chloro,
bromo,
fluoro,
trifluoromethyl,
C_1–C_3 alkyl or
C_1–C_3 alkoxy;
R^8 represents
chloro,
bromo,
fluoro,
trifluoromethyl,
C_1–C_3 alkyl or
C_1–C_3 alkoxy;
each of X^4 and X^5 represents hydrogen; and
each of X^6 and X^7 represents hydrogen.

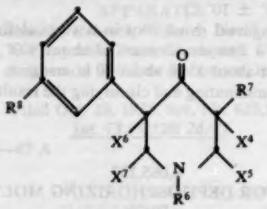
10. A compound of the formula



wherein
R represents methyl or ethyl;
R^1 represents
hydrogen,
phenoxy,
phenylthio,
C_1–C_4 alkoxy,
C_1–C_4 alkylthio,
C_1–C_4 alkyl,

phenyl or
phenyl monosubstituted with chloro or fluoro;
R^2 represents bromo, fluoro or trifluoromethyl.

13. A herbicidal composition which comprises an inert carrier and a compound of the formula



wherein
R^6 represents C_1–C_3 alkyl, C_2–C_3 alkenyl or propargyl;
R^7 represents
hydrogen,
phenoxy,
phenylthio,
C_1–C_4 alkyl,
C_1–C_4 alkoxy,
C_1–C_4 alkylthio,
phenyl or
phenyl monosubstituted with
chloro,
bromo,
fluoro,
trifluoromethyl,
C_1–C_3 alkyl or
C_1–C_3 alkoxy;
R^8 represents
chloro,
bromo,
fluoro,
trifluoromethyl,
C_1–C_3 alkyl or
C_1–C_3 alkoxy;
each of X^4 and X^5 represents hydrogen; and
each of X^6 and X^7 represents hydrogen.

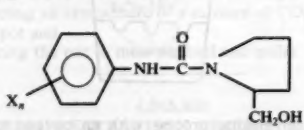
4,065,291

HERBICIDAL 1-(2-HYDROXYMETHYLPYRROLIDINYL) CARBOXANILIDES

John W. Kobzina, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 18, 1976, Ser. No. 697,498
Int. Cl.² A01N 9/22; C07D 207/08
U.S. Cl. 71—95 **12 Claims**

1. A compound of the formula



wherein X is hydrogen, fluoro, chloro, bromo, iodo, trifluoromethyl, trichloromethyl, alkyl of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or cyano, and *n* is 1, 2 or 3.

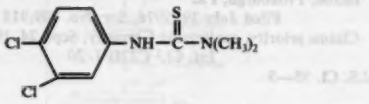
4,065,292

HERBICIDAL AGENTS

Christa Fest, Wuppertal; Edgar Enders, Cologne; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 1, 1976, Ser. No. 719,491
Claims priority, application Germany, Sept. 24, 1975, 2542468
Int. Cl.² A01N 9/14
U.S. Cl. 71—99 **5 Claims**

1. A method of combating weeds in corn which comprises applying to the corn habitat prior to weed emergence an effective amount of N-(3,4-dichlorophenyl)-N',N'-dimethylthiourea of the formula



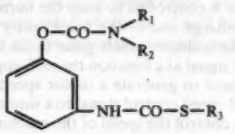
4,065,293

METHOD FOR CONTROLLING THE GROWTH OF WEEDS IN A FIELD CONTAINING GROWING PLANTS OF COTTON

Gerhard Boroschewski, and Friedrich Arndt, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Continuation of Ser. No. 610,908, Sept. 5, 1975, abandoned, which is a continuation of Ser. No. 444,408, Feb. 21, 1974, abandoned. This application Nov. 4, 1976, Ser. No. 739,154
Claims priority, application Germany, Mar. 1, 1973, 2310648
Int. Cl.² A01N 9/12
U.S. Cl. 71—100 **4 Claims**

1. A method for controlling the growth of weeds in a field containing growing plants of cotton which comprises applying to the field a compound of the formula:



wherein R_1 is lower alkyl, allyl, lower haloalkyl; R_2 is lower alkyl, allyl, lower haloalkyl, lower alkinyl, cyclohexyl, benzyl, or phenyl-ethyl; R_3 is methyl or ethyl, said compound being applied in amounts sufficient to substantially prevent the growth of weeds without damage to cotton plants.

4,065,294

ENERGY CONSERVING PROCESS FOR PURIFYING IRON OXIDE

James E. Barker, Blue Ridge, Ga., assignor to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 591,260, June 30, 1975, abandoned. This application Oct. 19, 1976, Ser. No. 735,228
Int. Cl.² C22B 1/08
U.S. Cl. 75—3 **27 Claims**

1. In a process of the purification of iron oxide normally using conventional fuels and conventional chlorinating agents and having the steps of:
a. Adding to the iron oxide a sufficient amount of binder,
b. Pelletizing the resulting mixture,
c. Drying the pellets and
d. Indurating the pellets to a temperature ranging from about 1200° C to about 1250° C and concurrently chlorinating the pellets using a conventional chlorinating agent:
the improvement comprising indurating and concurrently chlorinating the pellets using heat and chlorine valves

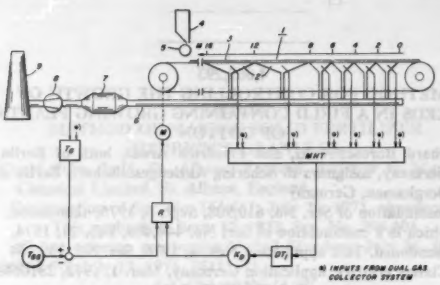
generated by combustion of a chlorinated hydrocarbon fuel having a heat of combustion of at least about 11,000 BTU/pound, said fuel comprising a mixture of chlorinated organic compounds having a combined elemental analysis of about 56% to about 87% carbon and about 9% to about 15% hydrogen and about 1% to about 35% chlorine.

4,065,295

SINTER MACHINE CONTROL AS A FUNCTION OF WASTE GAS TEMPERATURE

Fred Cappel, Sprendlingen; Walter Hastik, Frankfurt am Main, both of Germany; Georges Fleming, and Pierre Hofmann, both of Esch Alzette, Luxembourg, assignors to Dravo Corporation, Pittsburgh, Pa.

Filed July 29, 1976, Ser. No. 709,911
Claims priority, application Germany, Sept. 24, 1975, 2542473
Int. Cl.² C22B *1/20*
U.S. Cl. 75—5 **3 Claims**



1. A process for the automatic control of the travel speed of strand sintering machines used in the sintering of iron-oxide bearing materials of fine particle size in which gas is drawn through the iron-oxide bearing materials into windboxes and is collected in a collecting pipe and in which the speed of the sintering machine is controlled to keep the burn-through point ahead of the discharge end of the machine by measuring the temperature of the collected waste gases in the collecting pipe, generating a first signal as a function thereof, applying said first signal to a regulator to generate a motor speed control signal and applying said speed control signal to a sinter machine drive motor control to control the speed of the machine as a function of the collected waste gas temperature and generating a second signal as a function of the temperature of the waste gases at the windboxes and applying said second signal to said regulator to modify the speed control signal whereby the speed of the sinter machine is controlled as a function of the collected waste gas temperature as modified by the temperature of the waste gases at the windboxes.

4,065,296

PROCESS FOR PREPARING COMPOSITION CONTAINING CARBON AND LOW SULFUR, NITROGEN AND ASH CONTENT

Wilfried Gemmeke, Essen; Heinrich Werner, Wattenscheid; Heinz Echterhoff, Essen, and Erich Raulf, Castrop-Rauxel, all of Germany, assignors to Verkaufsgesellschaft fur Teererzeugnisse (VfT), Essen, Germany

Division of Ser. No. 661,070, Feb. 25, 1976, Pat. No. 4,031,189. This application Dec. 10, 1976, Ser. No. 749,489
Claims priority, application Germany, Mar. 13, 1975, 2510876
Int. Cl.² C21C *7/00*
U.S. Cl. 75—48 **9 Claims**

1. Process for carburizing iron or steel comprising adding to molten iron or steel a composition consisting essentially of carbon and containing only a small amount of ash, nitrogen and sulfur, said composition comprising a product obtained by:

A. drying a hydrous soot sludge of pasty consistency, said sludge having a water content of about 40 to about 70 percent by weight, with a hot flue gas having a temperature of about 600° C in a direct current operated dryer to form:

1. a vapor stream having a temperature of about 137° ± 20° C; and
2. a dried soot product having a water content of about 5 to about 20 percent by weight and a temperature of about 73° ± 10° C;

B. carbonizing said dried soot in a vertical flue oven by heating at a flue temperature of about 900° C to about 1300° C for about 25 to about 40 hours; and

C. drying, comminuting and classifying the resulting composition.

4,065,297

PROCESS FOR DEPHOSPHORIZING MOLTEN PIG IRON

Kantaro Sasaki; Takami Ikeda; Tohru Matsuo, and Takashi Okazaki, all of Amagasaki, Japan, assignors to Sumitomo Metal Industries Limited, Japan

Continuation-in-part of Ser. No. 727,517, Sept. 28, 1976, abandoned. This application Jan. 4, 1977, Ser. No. 756,968
Int. Cl.² C21C *7/02*
U.S. Cl. 75—52 **11 Claims**

1. A process for dephosphorizing molten pig iron prior to charging it into a converter so as to obtain pig iron having a low phosphorus content, the process including

1. forming a slag by
   a. adding a dephosphorizing agent to the molten pig iron when the pig iron is at a temperature of less than 1450° C;
   b. adding an oxidizing agent to the molten pig iron when the pig iron is at a temperature of less than 1450° C; and
2. removing the slag;

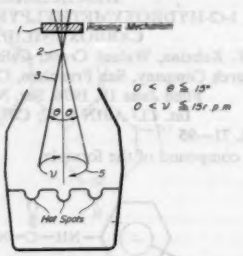
said steps (1) (a) and (1) (b) being such as to form a slag having a % CaO in an amount which corresponds to 0.3 to 3.0 times the sum of the amounts of % SiO_2 and % P_2O_5, and a total iron of 15 to 50%.

4,065,298

STEEL MAKING PROCESS BY OXYGEN TOP-BLOWN CONVERTER

Akira Masui, Kawasaki; Kenzo Yamada, Tokyo; Akinori Ninomiya, Yokohama; Katsuhiko Tachibana, Kamakura, and Yoshihiro Kato, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1975, Ser. No. 643,840
Claims priority, application Japan, Dec. 28, 1974, 49-3519
Int. Cl.² C21C *5/32*
U.S. Cl. 75—60 **2 Claims**



1. In a steel making process with an oxygen top blown converter wherein oxygen is blown in through a lance and wherein the hot spot formed by blowing is moved during blowing, the improvement which comprises maintaining the inclination angle (θ) of the lance from the supporting point of its upper portion within the range of $0 < \theta \leqq 15°$ to the normal

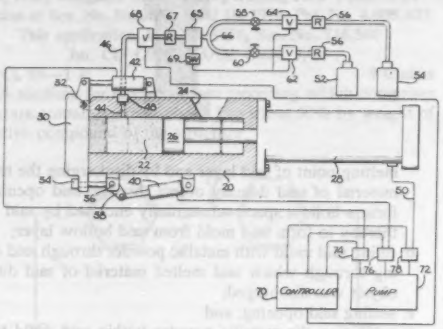
vertical axis, and maintaining the number of rotations of the lance (v) within the range of $0 < v \leqq 15$ rpm.

4,065,299

MAGNESIUM RECLAMATION PROCESS AND APPARATUS

Gregory Todhunter Roberts, Walnut; David Vincent Owens, Anaheim, and Raymond Frank Goodspeed, Garden Grove, all of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Oct. 23, 1975, Ser. No. 625,150
Int. Cl.[2] C22B *26/22*
U.S. Cl. 75—67 A **24 Claims**



1. A method of compacting magnesium fines, chips and scraps comprising the steps of:

a. placing the magnesium in the confined chamber of a press,

b. pressing the magnesium at a low pressure to collect the magnesium at one end of the confined chamber and to expel a substantial portion of the air in the chamber,

c. withdrawing the pressing element while providing an inert atmosphere in the increasing chamber volume, and

d. pressing the magnesium at a high pressure to concentrate the magnesium into a self supporting pellet.

21. A method of recovering magnesium fines, chips and scraps comprising the steps of:

a. placing the magnesium in the cylinder of a press having a closure member at a first end thereof and a piston extendable into the cylinder from the second end of the cylinder, the closure of the cylinder at the first end being pervious to gases,

b. extending the piston with a low pressure to collect the magnesium at the first end of the cylinder and to expel a substantial portion of the air in the cylinder,

c. withdrawing the piston while injecting a mixture of CO_2 and SF_6 into the cylinder adjacent to the first end of the cylinder at a rate at least equal to the rate of increase of volume in the cylinder,

d. extending the piston with a high pressure to permeate the magnesium with the CO_2–SF_6 mixture and to concentrate the magnesium into a self supporting pellet.

e. ejecting the pellet from the cylinder and placing the pellet on the heel of a cold magnesium melting pot,

f. injecting an atmosphere of a mixture of CO_2 and SF_6 into the pot and,

g. heating the pot to melt the heel and pellet.

4,065,300

METHOD FOR EXTRACTION OF COPPER PRODUCTS FROM COPPER BEARING MATERIAL

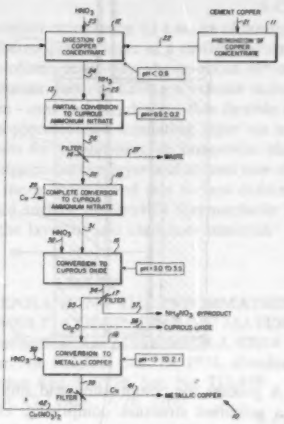
Archie L. Poarch, Mesa, Ariz.

Filed June 28, 1976, Ser. No. 700,410
Int. Cl.[2] C22B *15/08*
U.S. Cl. 75—117 **10 Claims**

1. An integrated process for preparing high-priority copper products from material comprising cement copper and/or other copper bearing materials comprising the steps of:

a. separating a powdered copper concentrate from said material;

b. preparing a copper nitrate solution in which copper is substantially the only metal ion present by reacting said concentrate in the presence of nitrogen with an aqueous solution of nitric acid to obtain copper nitrate in solution;



c. substantially completely reducing said copper nitrate with ammonia and copper bearing materials in the absence of oxygen to obtain cuprous ammonium nitrate in solution,

d. agitating said cuprous ammonium nitrate while maintaining a pH of approximately 3.0 to 3.5 and temperature of approximately 110 degrees Fahrenheit to 120 degrees Fahrenheit to obtain cuprous oxide, and

e. decomposing substantially all of said cuprous oxide with nitric acid to obtain metallic copper and copper nitrate in solution.

4,065,301

METHOD FOR PRODUCING TITANIUM NITRIDE-BASE SINTERED ALLOYS

Hiroshi Tanaka, Aichi, and Yoshihiro Yamamoto, Komaki, both of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Nov. 24, 1975, Ser. No. 635,155
Claims priority, application Japan, Dec. 19, 1974, 49-146102
Int. Cl.[2] B22F *3/16*; C22C *1/05*
U.S. Cl. 75—203 **8 Claims**

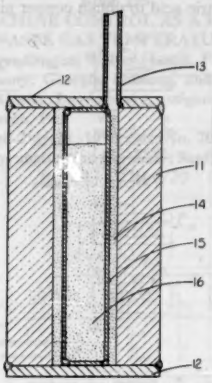
1. A method for producing titanium nitride-base sintered alloys, which comprises mixing carbon with a basic powdery raw material mixture composed of 65–95% by weight of TiN, 2–20% by weight of Mo and/or Mo_2C and 3–15% by weight of at least one iron family metal, the mixing amount of said carbon being 0.2–6.8 parts by weight based on 100 parts by weight of TiN contained in the basic raw material mixture, molding the resulting mixture and sintering the molded article, wherein when the molded article is sintered, the metal melts first, with fine particles of TiN and carbon dissolving into the molten metal while nitrogen gas escapes therefrom, and the dissolved carbon and titanium precipitate in the form of TiC on the surface of longer TiN particles, thereby resulting in a TiN-base sintered alloy composition.

4,065,302

POWDERED METAL CONSOLIDATION METHOD

Pierre Paul Turillon, Ramsey, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,586
Int. Cl.² B22F *3/14*
U.S. Cl. 75—208 R **11 Claims**



1. A process for compressing and sintering metal powder into a solidified structure comprising: enclosing a body of metal powder within a pressure-resistant container; providing adjacent to said metal powder and within said pressure-resistant container, a superplastic metal bladder containing a heat-decomposable compound adapted upon decomposition to release a gas within said metal bladder to expand said metal bladder and apply pressure to said metal powder; heating said pressure-resistant container above the decomposition temperature of said heat-decomposable compound and in the sintering temperature region for said metal powder thereby providing internally generated pressure to expand said metal bladder and compress and sinter together said metal powder to provide said solidified structure characterized by density at least 60% of theoretical density.

2. A process for coating a metal surface with a metal coating which comprises: providing adjacent to said metal surface to be coated a body of metal powder having a composition to provide said metal coating; providing a superplastic metal bladder containing a heat-decomposable compound, adapted upon decomposition to release a gas, therein in contact with said body of metal powder; surrounding said metal powder, said metal surface to be coated and said metal bladder with a pressure-resistant container; and heating a resulting assembly to a temperature above the decomposition temperature of said heat-decomposable compound and in the sintering temperature region for said metal powder thereby providing internally generated pressure to expand said metal bladder and compress and sinter said metal powder against said metal surface to provide said metal coating characterized by density at least 60% of theoretical density.

4,065,303

METHOD OF PRODUCING SHAPED OBJECTS

Helmut Seilstorfer, Munich, Germany; Willibald Wittich, deceased, late of Ottobrunn, Germany, and by Messerschmitt-Bolkow-Blohm GmbH, legal representative, Munich, Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed Oct. 19, 1976, Ser. No. 733,792
Claims priority, application Germany, Dec. 19, 1973, 2363141
Int. Cl.² B22F *1/00;* C25D *1/00*
U.S. Cl. 75—226 **7 Claims**

1. A method of forming a shaped object by compaction of metallic powder comprising:

a. forming a dummy object of a meltable material;

b. forming a mold within which said shaped object may be formed by hot isostatic pressing by electroforming on said dummy object a self-supporting layer having an outlet opening, said self-supporting layer thereby substantially enclosing said dummy object, said layer being formed of material having a melting point higher than the melting point of the material forming said dummy object:

c. removing the dummy object from within said layer by melting said dummy object at a temperature below the

melting point of said layer and by discharging the melted material of said dummy object through said opening to form a hollow space substantially enclosed by said layer thereby to form said mold from said hollow layer;

d. filling said mold with metallic powder through said opening through which said melted material of said dummy object was discharged;

e. sealing said opening; and

f. subjecting the metallic powder within said mold to hot isostatic pressing to densify and compact the powder to form said shaped object.

4,065,304

METHOD FOR FIXING INK IMAGES

Herbert N. Johnston; Joseph A. Wray, both of Columbus; Joe David Robbins, Pickerington, all of Ohio, and Morton Schrager, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1975, Ser. No. 636,337
Int. Cl.² G03G *13/16, 13/14*
U.S. Cl. 96—1 LY **9 Claims**

1. A method for fixing an image, comprised of marking particles suspended in an oil carrier, which comprises:

a. applying said image to a transfer paper comprised of a paper substrate which contains an oil-absorbent masking material, and which bears a physically-discontinuous overcoating of a thermoplastic fusing material;

b. heating said fusing material beyond its melting point such that the fusing material flows and forms an essentially continuous overcoat on the paper; and

c. allowing said fusing material to cool to fix the image.

4,065,305

XEROGRAPHIC DEVELOPER

Don B. Jugle, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 1, 1976, Ser. No. 662,644
Int. Cl.² G03G *9/10, 13/08*
U.S. Cl. 96—1 SD **10 Claims**

1. An electrostatographic developer mixture comprising from between about 0.3 and about 5.0 percent by weight, based on the weight of said developer mixture, of finely-divided toner particles having an average particle diameter of from between about 5 to about 30 microns electrostatically clinging to the surface of carrier particles, said carrier particles comprising from between from 95.0 and 99.7 percent by weight based on the weight of said developer mixture, of particles having an average particle diameter of from between about 30 microns and about 1,000 microns, said carrier particles further comprising a mixture of carrier particles wherein from be-

tween about 99 percent and about 90 percent by weight of said carrier particles have an average particle diameter of approximately the same size and wherein from between about 1 percent and about 10 percent by weight of said carrier particles have an average diameter of from between about two and about three times larger than the diameter of said carrier particles having an average particle diameter of approximately the same size.

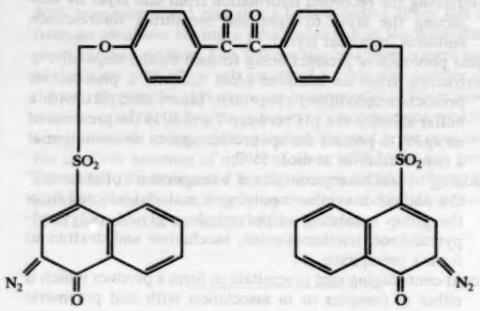
4,065,306

ELECTRON BEAM RECORDING MEDIA CONTAINING 4,4'-BIS(3-DIAZO-3,4-DIHYDRO-4-OXO-1-NAPHTHALENE-SULFONYLOXY)BENZIL

Daniel Louis Ross, and Lucian Anthony Barton, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 569,399, April 18, 1975, Pat. No. 4,005,437.
This application Aug. 23, 1976, Ser. No. 716,540
Int. Cl.[2] C07C 113/00; G03G 5/04
U.S. Cl. 96—1 R 9 Claims

1. A medium for electron beam recording which comprises a mixture containing from about 1 to about 50% by weight of an active compound of the structure



and an alkali-soluble resin.

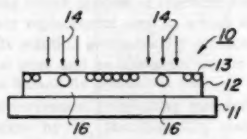
9. 4,4'-bis(3-diazo-3,4-dihydro-4-oxo-1-naphthalenesulfonyloxy)benzil.

4,065,307

IMAGED AGGLOMERABLE ELEMENT AND PROCESS OF IMAGING

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 862,907, Oct. 1, 1969, Pat. No. 3,753,705.
This application Mar. 2, 1973, Ser. No. 337,614
Int. Cl.[2] G03Q 5/02, 5/04, 5/087
U.S. Cl. 96—1.5 R 11 Claims



1. An imaged member comprising a softenable layer, an image configuration of agglomerable material in a relatively unagglomerated condition relative to a complementary image pattern comprising larger agglomerates, the relatively unagglomerated image pattern and the agglomerated complementary image pattern being located at the same level in depth in the softenable layer, the softenable layer in the unagglomerated image area being harder and corresponding portions of the imaged member being relatively less transparent than the portions of the imaged member corresponding to the agglomerated complementary image pattern areas.

4,065,308

DEFORMATION IMAGING ELEMENT

Richard F. Bergen, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,323
Int. Cl.[2] G03G 13/22
U.S. Cl. 96—1.5 R 9 Claims

1. An imaging member comprising (i) a series of contiguous layers including a thermoplastic layer of a surface deformable material having a volume resistivity above about 10^4 ohm - cms, a layer of elastomer material having a volume resistivity above about 10^4 ohm - cms and an adjacent thin flexible metal electrode, (ii) a photoconductive insulating layer on a substrate, and (iii) means for establishing an imagewise electric field across said photoconductive layer and at least one of said surface deformable thermoplastic and said surface deformable elastomer layers; said surface deformable thermoplastic layer being thinner than the layer of said elastomer material.

4,065,309

METHOD OF ENHANCING THE INFORMATION LEGIBILITY OF MULTI-COLOR GRAPHIC MATERIAL

Sol Domeshek, 24 Springfield Ave., Cranford, N.J. 07016

Continuation of Ser. No. 514,698, Oct. 15, 1974, abandoned.
This application Aug. 9, 1976, Ser. No. 713,019
Int. Cl.[2] G03C 7/16, 7/00
U.S. Cl. 96—14 9 Claims

1. Method of enhancing the information legibility of original multicolor graphic material, while retaining the colors of the original but reversing the colorless low optical density of the background of the original and high optical density of the black printed information of the original, said method including the steps of

A. analyzing the original multicolor graphic into its component colors by filtering the original multicolor graphic material through a set of at least 3 color separation filters covering the total visual spectrum to produce a set of positive filtered images of said original multicolor graphic material and simultaneously exposing each of a set of printing plates coated with light-hardening, panchromatically photosensitive, monochromatically recording material through halftone screens to each of said positive filtered images;

B. treating the set of printing plates by conventional photolitho/photo-engraving development techniques so that each plate may print only the patterns of the filter-colored light that struck it;

C. coating each of the set of printing plates with an ink having a color like the color of the filtered image to which

each photocoated printing plate was originally exposed; and

D. overprinting respectively in register from each of the set of photographically developed, color filtered and ink coated printing plates onto an optically low density, colorless print receiving surface.

4,065,310

FIXING AND RETRIEVING RECORDED INFORMATION PRODUCED BY MEANS OF PHOTOSENSITIVE MATERIAL OF BIOLOGICAL ORIGIN

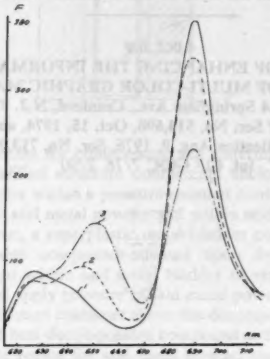
Esther Dujardin, 8, Avenue des Bois, 4050 Mery-Esneux, Belgium; Ysbrand Kuiper, Grammerode 21, St. Truiden, Belgium (B 3800); Rene Cremer, 2, Ave. des Tilleuls, Liege, Belgium (B 4000), and Cyrille Sironval, 8, Avenue des Bois, Mery-Esneux, Belgium (B 4050)

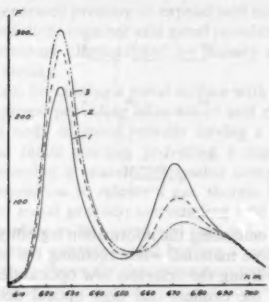
Continuation-in-part of Ser. No. 326,185, Jan. 24, 1973, Pat. No. 3,923,516. This application Oct. 30, 1975, Ser. No. 627,344

Claims priority, application United Kingdom, Jan. 25, 1972, 3498/72

Int. Cl.[2] G03C *5/04, 5/24*

U.S. Cl. 96—27 R **8 Claims**





1. A method of recording and reproducing information comprising the steps of:

providing a photosensitive layer of protochlorophyll(ide)-apoprotein photoactive product upon a layer carrier;

information-wise exposing said layer to light of a wavelength absorbed by said complex thereby forming a pattern of differentials in light-absorption and fluorescence emission characteristics representing the exposition pattern to record information;

fixing said layer by denaturation of the protein of said photoactive product; and

retrieving the recorded information from said layer by detecting a pattern of differences in intensity of light absorption of the layer;

said photoactive product being formed by the steps of:

extracting from an etiolated plant material a photoactive protochlorophyll(ide) apoprotein binary complex with a buffer solution at a pH between 7 and 10 in the presence of an agent to protect the apoprotein against denaturation at a temperature of at most 5° C;

adding to said binary complex at a temperature of at most 5° C a natural or synthetic polymeric material selected from the group consisting of polyethylene glycol, polyvinylpyrrolidone, triethanolamine, saccharose and dextran to form a precipitate;

cold-centrifuging said precipitate to form a product which is either in complex or in association with said polymeric material;

lyophilizing said product at a temperature of at most 5° C so that the dried final product remains photoactive at room temperature; and

providing said product in layer form suitable for recording.

4. A method of recording and reproducing information comprising the steps of:

providing a photosensitive layer of protochlorophyll(ide)-apoprotein photoactive product upon a layer carrier;

information-wise exposing said layer to light of a wavelength absorbed by said complex thereby forming a pattern of differentials in light-absorption and fluorescence emission characteristics representing the exposition pattern to record information;

fixing said layer by denaturation of the protein of said photoactive product; and

retrieving the recorded information from said layer by subjecting the layer to light and measuring fluorescence emission from said layer;

said photoactive product being formed by the steps of:

extracting from an etiolated plant material a photoactive protochlorophyll(ide) apoprotein binary complex with a buffer solution at a pH between 7 and 10 in the presence of an agent to protect the apoprotein against denaturation at a temperature of at most 5° C;

adding to said binary complex at a temperature of at most 5° C a natural or synthetic polymeric material selected from the group consisting of polyethylene glycol, polyvinylpyrrolidone, triethanolamine, saccharose and dextran to form a precipitate;

cold-centrifuging said precipitate to form a product which is either in complex or in association with said polymeric material;

lyophilizing said product at a temperature of at most 5° C so that the dried final product remains photoactive at room temperature; and

providing said product in layer form suitable for recording.

4,065,311

GLASS PAINTING METHOD

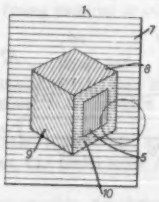
Anthony Walter Osborne, Godalming, England, assignor to Intechsa, S.A., Freibourg, Switzerland

Filed June 9, 1976, Ser. No. 694,395

Claims priority, application United Kingdom, June 10, 1975, 24919/75

Int. Cl.[2] G03C *5/04*

U.S. Cl. 96—27 R **6 Claims**



1. A process for the production of a painted reproduction on glass of a subject, which comprises photographing the subject using a fine grain medium contrast panchromatic photographic film, processing the film to produce a low-contrast image, projecting the image on the film as a black image on to a photographic glass plate coated with a slow, blue-sensitive high contrast orthochromatic emulsion having very fine grain and very high resolution, bleaching out the black image produced on said glass plate and toning said image in a colour other than black, coating the emulsion side of the glass plate

with a clear varnish, and colouring the image on the glass plate with paint applied to the varnish coating in two stages, paint first being applied to detailed parts of the image in substantially exact conformity with the margins of the detail and paint thereafter being applied to remaining parts of the image after drying the paint applied to the detail parts, the paint being applied to said remaining image parts in such manner that small zones free of paint exist between adjacent painted areas.

4,065,312

PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC VESICULAR IMAGES IN PHOTOGRAPHIC SILVER HALIDE MATERIAL

Edith Weyde, Kuerten; Anita von Konig, and Werner Liebe, both of Leverkusen, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Apr. 16, 1975, Ser. No. 568,603
Claims priority, application Germany, Apr. 19, 1974, 2418997
Int. Cl.² G03C *5/26*
U.S. Cl. 96—50 R **22 Claims**

1. A dry process for the production of photographic images in a self-supporting or supported layer including the steps consisting essentially of imagewise exposing a layer which is 80% transparent and contains a light-sensitive silver salt cast from an emulsion having a pAg value below the equivalence point and having from 1 to 500 mg silver salt per square meter of the layer with silver salt grains of a grain size smaller than 0.3 μm, forming by said exposure image nuclei of silver imagewise in catalytic amounts capable of decomposing peroxide compounds on image nuclei; treating the said layer containing the catalytic amounts of nuclei of silver with hydrogen peroxide which is decomposed by the image nuclei to form light scattering vesicles; causing formation on said catalytic amounts of silver nuclei of an image of fine bubbles.

4,065,313

BLEACH-FIX REGENERATION MONITORING METHOD

Frederick Lee Shippey, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 11, 1976, Ser. No. 695,273
Int. Cl.² G03C *5/32*
U.S. Cl. 96—60 BF **7 Claims**

1. In a process for regenerating a spent bleach-fix photographic solution to restore its bleaching capability and thereby permit its reuse in photographic processing, the bleaching agent being a ferric complex of an aminopolycarboxylic acid, the spent bleach-fix solution comprising silver ion and ferrous ion as a result of its use in a bleach-fix step of photographic processing which process of regeneration comprises in series a first silver replacement step in which silver ion in the spent bleach-fix solution is chemically replaced by reduction using elemental iron, and an oxidation step in which ferrous ion in the spent bleach-fix solution is oxidized to ferric ion;

the improvement comprising monitoring said regeneration process by electrochemically comparing the half-cell potential of the ferric-ferrous couple in a sample of the bleach-fix solution drawn from either said first silver replacement step or said oxidation step, with the half-cell potential of the ferric-ferrous ion couple in a reference solution drawn from a region of said regeneration process in which the bleach-fix solution is substantially insensitive to exhaustion of said elemental iron and insufficient oxidation, whereby either exhaustion of said elemental iron is detected when said sample bleach-fix solution is drawn from said first silver replacement step or insufficient oxidation is detected when said sample bleach-fix solution is drawn from said oxidation step.

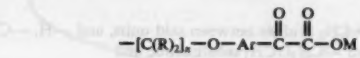
4,065,314

PHOTOREACTIVE COMPOSITIONS COMPRISING POLYMERS CONTAINING ALKOXYAROMATICGLYOXY GROUPS

Thaddeus M. Muzyczko, Downers Grove, and Thomas H. Jones, Naperville, both of Ill., assignors to The Richardson Company, Des Plaines, Ill.

Continuation of Ser. No. 585,215, June 9, 1975, Pat. No. 3,969,119, which is a division of Ser. No. 267,475, June 29, 1962, Pat. No. 3,888,671. This application July 12, 1976, Ser. No. 704,494
The portion of the term of this patent subsequent to July 13, 1993, has been disclaimed.
Int. Cl.² G03C *1/68*
U.S. Cl. 96—115 R **21 Claims**

1. A light sensitive composition comprising: a polymer which includes as a recurring structure:



wherein R is selected from the group consisting of hydrogen, aryl, alkyl, halo and ara." yl having up to 10 carbon atoms and *n* is an integer from 1 to 18, Ar is an aromatic substituent and M is selected from the class consisting of hydrogen, alkali metal, ammonium and substituted ammonium; and, a photosensitizer in addition to said polymer.

4,065,315

PHOTOTROPIC DYE SYSTEM AND PHOTOSENSITIVE COMPOSITIONS CONTAINING THE SAME

Toshio Yamazaki, Mission Viejo; Harriet J. Cook, Los Alamitos, and Melvin A. Lipson, Fullerton, all of Calif., assignors to Dynachem Corporation, Tustin, Calif.

Filed Apr. 26, 1976, Ser. No. 680,304
Int. Cl.² G03C *5/24, 1/52, 1/68*
U.S. Cl. 96—48 QP **29 Claims**

1. A stable photopolymerizable composition comprising:

a. an acrylyl or methacrylyl compound thereof capable of forming a high polymer by free radical initiated polymerization;

b. a free-radical generating addition polymerization initiator activatable by actinic radiation;

c. the free base of a dyestuff whose halide salt is more intensely colored than the free base; and

d. the normally solid amide of a halogenated aliphatic carboxylic acid that releases halide free radicals upon exposure to actinic light.

4,065,316

PRINTING INK

William James Baron, Franklin Township, Somerset County, and Patrick John Capano, East Windsor, both of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 706,655, July 19, 1976, abandoned. This application Nov. 17, 1976, Ser. No. 742,484
Int. Cl.² C09D *3/52, 3/58*
U.S. Cl. 106—20 **33 Claims**

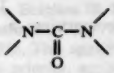
1. A printing ink which comprises:

a. a resin mixture consisting essentially of an epoxy resin, combined with a second resin comprising a substantially anhydrous water-soluble thermosetting stable methylated urea-formaldehyde resin wherein the weight of the methoxyl substituents therein is between 28 and 40% of the weight of the resin and the molar ratio of the reacted formaldehyde in said resin to said methoxyl substituents is such that in the absence of organic solvent the resin at 25° C. is soluble to the extent of at least 50% by weight in water and dissolves at least 50% of its weight of toluene, the polymeric form of said resin being not substantially in

excess of tetrameric, the molar ratio of reacted urea to reacted formaldehyde in said resin and the molar ratio of reacted formaldehyde to reacted methanol therein being within the ranges:

Ranges	Molar ratio				
	Urea	$:CH_2O$	$:CH_3OH$	CH_2O	$:CH_3OH$
Lower	1	2.2	1.3	1	1.10
Upper	1	2.8	2.0	1	2.15

and said resin consisting essentially of



units, $—CH_2$ bridges between said units, and —H, $—CH_2OH$ and $—CH_2OCH_3$ substituents; and

b. a pigment.

4,065,317

NOVEL GLASS COMPOSITIONS

Nils Tryggve E. A. Baak, Princeton, N.J., and Charles F. Rapp, Toledo, Ohio, assignors to Nippon Electric Glass Company, Ltd., Otsu, Japan

Continuation of Ser. No. 193,576, Oct. 28, 1971, which is a continuation of Ser. No. 193,192, Oct. 27, 1971, which is a continuation of Ser. No. 546,049, April 28, 1966, abandoned. This application Dec. 3, 1971, Ser. No. 204,672

The portion of the term of this patent subsequent to Dec. 27, 1991, has been disclaimed.

Int. Cl.² C03C *3/00*

U.S. Cl. 106—52 **29 Claims**

1. A glass composition consisting essentially of 75 to 82 mole percent SiO_2, 2 to 8 mole percent ZrO_2, 1 to 5 mole percent Al_2O_3, 2 to 10 mole percent Na_2O, 2 to 10 mole percent K_2O, 2 to 10 mole percent CaO, 2 to 10 mole percent SrO, and 2 to 10 mole percent BaO, said composition being essentially free from boron.

4,065,318

WELL CEMENTING

William John Detroit, Schofield, and Michael Elliot Sanford, Wausau, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Mar. 29, 1976, Ser. No. 671,159

Int. Cl.² C04B *7/35*

U.S. Cl. 106—90 **30 Claims**

1. In a cementing composition comprised of a hydraulic cement, a retarding agent additive therefor which is, in an amount between about 0.05 percent and about 3 percent based on cement composition weight;

an alkaline oxidized, hydrolyzed, partially desulfonated and subsequently resulfonated lignosulfonate, said resulfonated lignosulfonate having substituted herein as the resulfonation units, those of the formula: $—(CH_2)_x—SO_3H$, wherein x has a numerical integral value from 0 to 3, and alkali metal salt derivatives thereof;

said resulfonated lignosulfonate containing, on a percent by weight basis, based on lignosulfonate weight, between about 1½ percent and about 15 percent of total sulfur in combined organic sulfonic sulfonate form; said lignosulfonate prior to resulfonation having a relative molecular size of substantially 1000 to 20,000.

4,065,319

TILE CEMENTS

Armand Joseph Desmarais, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 18, 1975, Ser. No. 633,061

Int. Cl.² C04B *7/353, 13/00*

U.S. Cl. 106—93 **1 Claim**

1. In a dry mortar-forming composition which consists essentially of about 24 to 99% by weight of hydraulic cement, about 0 to 75% sand, about 0 to 2% finely divided fibers, and about 0.4 to 4% of a water-retaining thickener, said dry composition being capable, when mixed with about 25 to 40% of its own weight of water, of producing a mortar which can be applied in thin layers for setting tile on walls and ceilings, the improvement which comprises said water-retaining thickener being a modified hydroxyethyl cellulose having hydroxyethyl M.S. between about 1.5 and 2.8 and a second substituent selected from the class consisting of

a. phenylhydroxyethyl at a D.S. level between about 0.04 and 0.15 and

b. benzyl at a D.S. level between about 0.04 and 0.15.

4,065,320

SYSTEM FOR HANDLING HIGH SULFUR MATERIALS

Glenn A. Heian, Franklin, Wis., and Robert F. Kohl, Tucson, Ariz., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 13, 1975, Ser. No. 576,995

Int. Cl.² C04B *7/36*

U.S. Cl. 106—100 **19 Claims**

1. In a process for treating cement materials having a high sulfur and high alkali or a high sulfur content in a material treating furnace arrangement in which a stream of the material supplied by a pelletizer is progressed by grate means through a drying zone having a negative pressure drying zone wind box and a preheat zone having a bypass, a kiln and a cooling zone including a recoup system, and also having a double-pass fan system which pulls a gas stream from the kiln into the preheat zone and through the pellet bed on the grate and delivers the gases to the drying zone as drying heat, comprising the steps of:

A. directing sulfur-laden kiln off-gases into preheat zone;

B. adding a quantity of lime-bearing material which is chemically reactive with sulfur to sulfur-laden kiln off-gases in the preheat zone to effect a reaction between the sulfur in the gases and the added material to form a solid sulfur compound in dust form which moves with the gas stream;

C. mixing kiln off-gases that have been treated with the chemically reactive material from the preheat zone with tempering air;

D. passing the tempered mixed gases of step C through a dust collector to remove a major portion of the solid sulfur compound dust particles from the mixed gases; and,

E. passing the cleansed gases of step D to preheat zone.

4,065,321

PROCESS FOR THE PRODUCTION OF CEMENT CLINKER FROM FUEL SHALE

Karl Entzmann, 10, Eichbergstrasse, A-2371 Hinterbruhl, Austria

Filed Oct. 29, 1976, Ser. No. 737,013

Claims priority, application Austria, May 6, 1976, 3334/76

Int. Cl.² C04B *7/44*

U.S. Cl. 106—106 **8 Claims**

1. A method of processing an argillaceous or calcareous material capable of yielding a cement clinker to produce a cement clinker therefrom, comprising the steps of:

a. subjecting said material to mechanical disintegration in a pin-type disintegrator in which the particles formed are subjected to repeated acceleration and retardation within a period of less than about 0.05 second, thereby homogenizing and activating said material; and

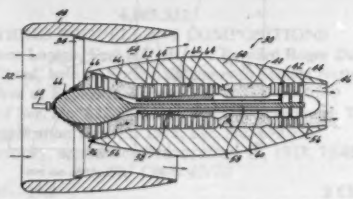
b. sintering said disintegrated material at a temperature of between about 900° C. and about 1300° C. for a period of time between about 3 and about 10 minutes, thus volatilizing any organic components of said material and forming said clinker.

4,065,322

CONTAMINATION REMOVAL METHOD

John R. F. Langford, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 23, 1976, Ser. No. 660,619
Int. Cl.² B08B 7/00
U.S. Cl. 134—7 **37 Claims**



1. A method of removing contaminants from the surface of a metallic article comprising the steps of:

providing abrasive particles comprised of coke; and

directing said abrasive particles in impingement onto said contaminated surface thereby removing said contaminants therefrom.

4,065,323

DEGREASING PROCESS USING STABILIZED METHYLCHLOROFORM SOLVENT

Charles L. Cormany, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 16, 1976, Ser. No. 723,876
Int. Cl.² B08B 3/08, 7/04
U.S. Cl. 134—10 **8 Claims**

1. In a process for degreasing metal articles by contacting metal articles in a cleaning zone with methylchloroform solvent, said solvent stabilized by a stabilizing agent including an organic epoxide, the improvement comprising:

maintaining the acid acceptance of the solvent by continuously performing the step of removing stabilized methylchloroform solvent from the cleaning zone, treating said removed solvent by contacting it with a continuous liquid phase consisting essentially of polyhydroxy alcohol having a density lower than said solvent and having low solubility therein of less than 5.0 percent by volume, having high affinity for water, and having less than about 10 weight percent absorbed water, thereafter separating treated solvent from said polyhydroxy alcohol phase, and returning said treated solvent to the cleaning zone.

4,065,324

CONTACT LENS CLEANING SOLUTION

Billy F. Rankin, Rockville, Md., assignor to Burton, Parsons and Company, Inc., Washington, D.C.

Filed Dec. 16, 1976, Ser. No. 751,068
Int. Cl.² B08B 3/10, 11/00; C11D 7/10, 7/14
U.S. Cl. 134—30 **13 Claims**

1. A solution for cleaning hydrophobic silicone or hydrophilic soft contact lenses, which solution comprises sodium sesquisilicate dissolved in deionized or distilled water to the extent of 0.5% by weight and sufficient dilute hydrochloric acid to achieve a pH of approximately 7.0.

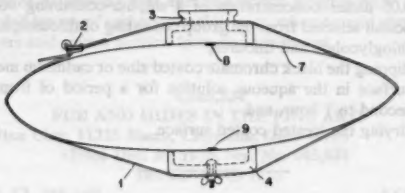
2. A method of cleaning proteinaceous and other tear deposits from soft contact lenses which method comprises applying to said lenses a few drops of an aqueous solution containing from about 0.1–5% crystalline sodium silicate, said solution having an isotonic pH of about 7.0, rubbing the lenses with the fingers and rinsing with water.

4,065,325

ADAPTABLE FLUSH ATTACHMENT FOR MARINE ENGINES HAVING SIDE COOLING WATER PORTS

John Vincent Maloney, 1985 Illinois Ave. NE., St. Petersburg, Fla. 33703

Filed Mar. 25, 1976, Ser. No. 658,761
Int. Cl.² B08B 3/02, 9/00
U.S. Cl. 134—167 R **6 Claims**



1. A fresh water flushing device for small boat marine engines having side cooling water ports in the drive unit housing, consisting of a flexible strap, a flexibly resilient non-metallic generally rectangular cup shaped device having an aperture in the bottom center of such an internal diameter to tightly engage a common garden hose male fitting, the rim of the cup shaped device being substantially rigid and extending outwardly from the housing at substantially right angles to the cooling water ports and being of such size as to surround the cooling water inlet ports on one side of the unit, this cup shaped device being attached in a lengthwise fixed position on the strap, a second generally rectangular cup shaped device similar in size and material to the first cup adjustably fixed to the strap at a lengthwise location thereon as to cover the cooling water ports on the opposite side of the unit, the strap extending beyond both cup shaped devices and of a length to be wrapped around the motor shaft drive unit with a quick detachable fastener at the end of the strap to perform the function of attaching the ends of the strap at whatever length required to hold the device in place on the motor shaft drive unit thereby providing a flushing attachment adaptable to all types and sizes of outboard and inboard/outboard marine engines with side cooling water ports.

4,065,326

ELECTRICAL CONDUCTORS OF ALUMINUM-BASED ALLOYS AND PROCESS FOR THE MANUFACTURE THEREOF

Jean-Claude Nicoud, Saint-Egreve, France, assignor to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed May 28, 1976, Ser. No. 691,010
Claims priority, application France, May 28, 1975, 75.17202
Int. Cl.² C22F 1/04
U.S. Cl. 148—2 **4 Claims**

1. In a process for the production of a wire by the sequential steps of continuously casting and rolling of a bar of an aluminum-silicon alloy consisting of by weight from 0.30 to 0.80% of Mg, from 0.30 to 0.70% of Si, from 0.15 to 0.35% of Fe, less than 0.20% of Cu, and the remainder of aluminum and the usual impurities, said rolling being carried out at a temperature of between 400° and 500° C and drawing the rolled bar into wire, the improvement comprising immediately after drawing rapidly cooling said rolled bar to a temperature below 150° C, tepid drawing at a temperature of from about 110° C to about 180° C with an elongation of at least 350%, followed by artificially aging at a temperature between about 130° C and about 240° C wherein the ultimate tensile strength of the wire is about 37 kg/mm² to about 41 kg/mm².

4,065,327

BLACK CHROMATE COATINGS

John Russell House, Slough, England, assignor to Imasa Limited, England

Filed Nov. 15, 1976, Ser. No. 742,112
Claims priority, application United Kingdom, Nov. 24, 1975, 48273/75
Int. Cl.² C23F 7/26
U.S. Cl. 148—6.21 6 Claims

1. A method for treating a black chromate coated zinc or cadmium metal surface, which method comprises:

a. providing an aqueous solution at a pH of 4 to 10 and a temperature of from 10° C to 100° C containing at least 0.05 molar concentration of a sulphur-containing compound selected from the group consisting of thiousulphate thioglycolate and thiourea,

b. dipping the black chromate coated zinc or cadmium metal surface in the aqueous solution for a period of from 1 second to 1 hour, and

c. drying the treated coated surface.

4,065,328

HIGH STRENGTH SN-MO-NB-ZR ALLOY TUBES AND METHOD OF MAKING SAME

Brian A. Cheadle, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Apr. 28, 1976, Ser. No. 681,293
Claims priority, application Canada, May 6, 1975, 226385
Int. Cl.² C22F 1/18; C22C 16/00
U.S. Cl. 148—12.7 B 9 Claims

1. In a method of fabricating extruded alloy tubes from an alloy consisting essentially of Sn 2.5–4.0%, Mo 0.5–1.5%, Nb 0.5–1.5%, O 800–1300 ppm, balance Zr and incidental impurities, in which said alloy is preheated to a temperature in the range 850°–900° C, extruded through a tube forming die, cold worked to size and age hardened by heating at a temperature in the range between 400° and 500° C, the improvement comprising rapidly cooling said extruded tube immediately following extrusion at a rate of at least 30° C per second so as to develop a microstructure comprising hexagonal α grains elongated in the extrusion direction and an acicular grain boundary phase.

7. A high strength extruded alloy tube made by the process of claim 1.

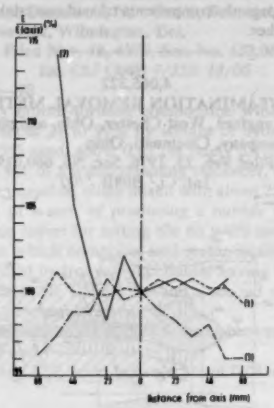
4,065,329

CONTINUOUS HEAT TREATMENT OF COLD ROLLED STEEL STRIP

Philippe Paulus, and Mario Econompoulos, both of Liege, Belgium, assignors to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Jan. 16, 1977, Ser. No. 649,597
Claims priority, application Luxembourg, Jan. 17, 1975, 76664
Int. Cl.² C21D 1/48
U.S. Cl. 148—18 9 Claims

1. In a process for continuously heat-treating steel elongated products to increase the limit of elasticity, ductility and homogeneity of properties throughout its width, including the steps of heating the product to a first temperature between its recrystallization temperature and 1000° C, maintaining the process at the first temperature for at least 30 seconds to recrystallize the product and quenching the product, the improvement being that the product is a cold-rolled strip, and providing an aqueous bath quenching medium maintained at a temperature selected to yield a strip product exhibiting a deviation in elastic limit in the direction of width less than ± 3% from the value at the longitudinal axis, which temperature is substantially the boiling point of the bath within a range of 80° to 150° C, immersing the strip in said bath for a time of from 10 seconds to



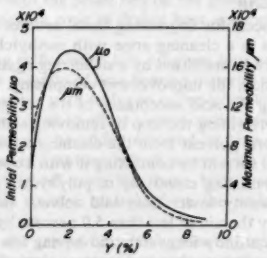
2 minutes to cool the strip to a second temperature, then further cooling the strip to ambient temperature.

4,065,330

WEAR-RESISTANT HIGH-PERMEABILITY ALLOY

Hakaru Masumoto, Sendai, and Yuetsu Murakami, Izumi, both of Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys

Continuation-in-part of Ser. No. 604,995, Aug. 15, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,267
Claims priority, application Japan, Sept. 26, 1974, 49-110881; Mar. 7, 1975, 50-27864; Apr. 4, 1975, 50-41082
Int. Cl.² C04B 35/00; C22C 38/06
U.S. Cl. 148—31.55 12 Claims



1. A heat treated, wear-resistant high-permeability alloy having an initial permeability of more than 1,000, a maximum permeability of more than 3,000, a hardness of more than 490 (Hv) and an average grain size of smaller than 2 mm, and consisting of by weight 3–13% of silicon, 3–13% of aluminum, 0.01–7% of at least one element selected from yttrium and lanthanum series elements and remainder of iron.

4,065,331

ROLLED LOW CARBON NIOBIUM STEEL

Frederick J. Semel, Philadelphia, Pa., assignor to Alan Wood Steel Company, Conshohocken, Pa.

Filed Oct. 8, 1976, Ser. No. 730,937
Int. Cl.² C22C 38/06, 38/16
U.S. Cl. 148—36 2 Claims

1. A steel in the as-rolled condition as a result of normal rolling practice having a lower yield point of at least 42.0 kilograms per square millimeter at room temperature, and a 2.8 kilogram meter Charpy V-notch transition temperature of no

greater than −50° C, having a composition consisting essentially of the following, expressed in percentages by weight:

Carbon	.07 to .11
Manganese	.40 to .60
Silicon	.30 to .40
Nickel	.20 to .30
Copper	.20 to .30
Aluminum	.08 to .10
Niobium	.07 to .12
Nitrogen	.008 to .011
Iron and impurities	Balance

4,065,332

HYBRID PROPELLANT COMPOSITIONS

Michel Pierre Lorson, Vert le Petit, and Bernard Roger Dumas, Vert le Grand, both of France, assignors to Societe Nationale des Poudres et Explosifs, France

Division of Ser. No. 422,728, Dec. 7, 1973, abandoned. This application Dec. 11, 1975, Ser. No. 639,930
Claims priority, application France, Dec. 19, 1972, 72.45154
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.9 2 Claims

1. A solid component for a hybrid propellant, which comprises

1. a solid amine which is 2,4-diamino-toluene, 2,6-diamino-toluene, or melamine, and
2. an organic liquid binder, said binder comprising functional groups capable of being cross-linked by an agent containing a cross-linking grouping selected from the group consisting of epoxide and aziridinyl groupings, being capable of hardening at a temperature lower than the melting point of said amine, said binder being a member selected from the group consisting of carboxytelechelate polybutadienes, carboxytelechelate polybutadiene/styrene copolymers, carboxytelechelate polybutadiene/acrylonitrile copolymers and mixtures thereof with a liquid organic polyacid,

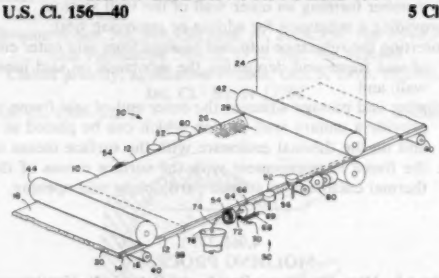
the proportion of said binder being more than 15% by weight, based on the solid component.

4,065,333

FACING SHEET EDGE TRIMMING

John L. Lawlis, Roby; Bernard L. Rodgers, Rotan, both of Tex., and Daniel A. Winkowski, Tonawanda, N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,155
Int. Cl.[2] B32B *30/04, 31/00*; B24B *1/00*
U.S. Cl. 156—40 5 Claims



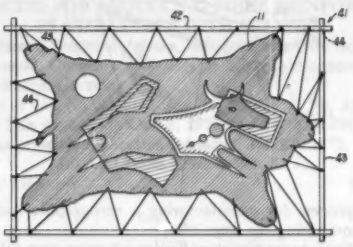
1. The method of making a plastic sheet covered wallboard with the plastic sheet extending uniformly from on one side edge of said wallboard across the face of said wallboard to onto the opposite side edge of said wallboard comprising the steps of laminating a thin plastic sheet onto the entire front face of a wallboard with side portions of said plastic sheet on each side having a width greater than the thickness of said wallboard at the edges, folding said plastic sheet side portions and adhering said plastic sheet side portions to the two side edges of said wallboard with an excess portion of said plastic sheet extending beyond the edge back corner on each side edge of said wallboard, trimming said excess portion from said plastic sheet covered wallboard, said trimming comprising the steps of disposing a rotary abrader having flexible abrading elements extending radially outwardly adjacent said edge back corner and rotating said rotary abrader with said abrader periphery engaging said plastic sheet at said edge back corner with a motion relative to the board edge in a direction from the front face toward the back edge corner, abrading said plastic sheet with said abrader with sufficient force to penetrate said plastic sheet, and moving said wallboard relative to said rotary abrader to provide said abrading action progressively along the full length of said edge back corner, whereby said abrading severs said excess portion from said wallboard.

4,065,334

FUR AND HIDES IN THE FINE ARTS

Clifton Clay, 11215 Itasca, Cleveland, Ohio 44106

Filed Dec. 30, 1975, Ser. No. 645,434
Int. Cl.[2] C14B *1/02*
U.S. Cl. 156—68 3 Claims



1. The method of producing a skin painting of desired design which comprises the steps of:

stapling a buffalo hide to a vertical surface,

applying heat to hairs in selected areas of the hide to embrittle the hair thereon,

utilizing a cutting tool with a curved edge varying progressively in curvature for enabling precisely varying and selected outlined segments to be formed at the margin of bare skin and hair by carving away the embrittled hairs from a selected area of the hide to form a bare surface area along outlines to form boundaries of selected portions of the desired design,

applying acrylic pigment to the bare surface area in simple geometrical configurations such as triangles, circles and rectangles to form portions of the painting within such boundaries to produce a composite picture of applied pigment and hair retained on the skin, the configuration of boundaries being along lines representing tribal designs,

cutting a stiff backing sheet with an outline following the outline of the hide,

gluing the hide to the backing sheet,

surrounding the hide with wooden frame members,

piercing holes in the hide and backing sheet along the outline thereof,

driving horseshoe nails into the frame members at points spaced from the pierced holes in the hide and backing sheet,

passing a thong through the holes and looping the thongs around the horseshoe nails to mount the hide within the frame members, whereby a mounted tribal painting is produced from natural hides and protected from drying out, the boundaries between hair and portions of the hide from which hair has been removed being either carved away from elements of the design or carved into it so that

either acrylic paints or hair remaining on the hide will form the desired element of the design.

4,065,335

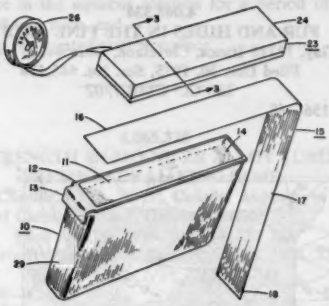
PROCESS FOR MANUFACTURING A XEROGRAPHIC TONER CARTRIDGE

Maxwell Aaron Pollack, Morris Plains, N.J., assignor to Van Dyk Research Corporation, Whippany, N.J.

Continuation of Ser. No. 599,676, July 28, 1975, abandoned, which is a division of Ser. No. 489,694, July 18, 1974, Pat. No. 3,999,654, which is a continuation of Ser. No. 314,542, Dec. 13, 1972, abandoned. This application Sept. 13, 1976, Ser. No. 722,776

Int. Cl.² B29C *27/10*; C09J *5/00*

U.S. Cl. 156—69 **4 Claims**



1. A process for manufacturing a xerographic toner cartridge, comprising the steps of:

providing a toner container having a bottom, two side walls, two end walls and an elongated surface opening therein opposite said bottom, with a peripheral lip surrounding said opening;

filling said container with a heat-fusible xerographic toner powder;

positioning an elongated smooth-surfaced flexible tongue comprising a tear-resistant material having non-directional shear strength characteristics adjacent said lip so that said tongue covers said opening, said material comprising a sheet structure including a multiplicity of randomly oriented and bonded fibers, the length of said tongue being greater than twice the length of said opening, said tongue having a sealing portion covering said opening and an adjacent tab portion having a length greater than that of said sealing portion, said tongue having a thickness on the order of 1 to 10 mils;

disposing a heat-activatable thermoplastic adhesive layer between said peripheral lip and the sealing portion of said tongue, said adhesive when activated being more strongly adherent to said peripheral lip than to the sealing portion of said tongue, so that both surfaces of any part of said sealing portion later peeled from said lip will be free of said adhesive, said layer having a thickness on the order of 0.05 to 2 mils;

providing a platen having a circumferential ridge dimensioned to conform to the size and shape of the peripheral lip of said toner container;

heating said platen to, and maintaining said platen at a predetermined operating temperature;

contacting said tongue with the circumferential ridge of said heated platen to press said tongue against said lip for a time sufficiently long to soften said thermoplastic adhesive so that upon rehardening the thermoplastic adhesive forms a secure adhesive bond between said lip and the adjacent part of the sealing portion of said tongue to prevent the escape of toner powder from said container, the temperature and time associated with said contacting step providing insufficient heat transfer to cause fusing deterioration of the toner powder within said container; and

folding said tongue at the junction of the sealing and tab portions thereof to dispose said tab portion adjacent said sealing portion with the free end of said tab portion protruding beyond said lip adjacent one of said container walls, the shear strength of said tongue along said fold being at least 85 percent of the shear strength of portions of said tongue remote from said fold,

said tongue comprising a material having a shear strength in any direction substantially greater than the peel strength of said activated adhesive bond between said sealing portion of said tongue and said peripheral lip.

4,065,336

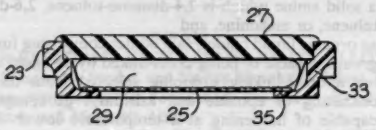
METHOD OF MAKING A WALL SECTION FOR A THERMAL ENCLOSURE

Hale Conklin, Santa Ana, Calif., assignor to Divajex, Santa Ana, Calif.

Division of Ser. No. 608,182, Aug. 27, 1975, Pat. No. 4,019,340. This application Oct. 14, 1976, Ser. No. 732,515

Int. Cl.² B65B *7/00*

U.S. Cl. 156—69 **11 Claims**



1. A method of making a unitary wall section for at least partly closing an opening in a thermal enclosure wherein the thermal enclosure has surface means adjacent the opening, comprising:

providing a frame having inner and outer ends, a passage extending into said frame in a generally axial direction from said outer end toward said inner end, a peripheral wall, a ledge extending radially inwardly from the peripheral wall with said ledge being axially inwardly of said outer end, and surface means adapted to engage the surface means of the thermal enclosure;

passing a member through said passage from said outer end of said frame to said ledge with an edge portion of said member being supported by said ledge and with said member forming an inner wall of the wall section;

providing a substance for adding or removing heat;

inserting the substance into said passage from said outer end of said frame and depositing the substance on said inner wall; and

closing said passage adjacent the outer end of said frame to provide a unitary wall section which can be placed as a unit on the thermal enclosure with the surface means of the frame in engagement with the surface means of the thermal enclosure to at least partly close said opening.

4,065,337

MOLDING PROCESS

Hobart L. Alter, Capistrano Beach, and Peter L. V. Hutchinson, Laguna Beach, both of Calif., assignors to Coast Catamaran Corporation, San Juan Capistrano, Calif.

Filed Apr. 18, 1973, Ser. No. 352,753

Int. Cl.² B32B *5/18*

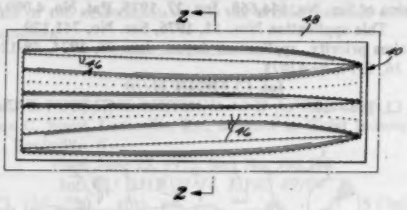
U.S. Cl. 156—78 **5 Claims**

1. A process for making a boat hull, said process including the steps of:

forming a main body shell and a complementary deck shell, said shells initially being separated;

applying a heat-activated adhesive to the interior surfaces of said shells while said shells are separated;

providing a rigid nest for each of said shells having the configuration of the exterior of said main body shell and said deck shell;
positioning the formed main body and deck shells within their respective nests;
providing a steam chest for each of said shells having the exterior configuration of the interior of said main body shell and said deck shell;
complementarily interfitting said steam chests within their respective shells, the exterior of said steam chests being spaced from the interior of said shells;
depositing a heat-expandable synthetic plastic foam within the space between each steam chest and its respective shell;
heating said plastic foam to cause it to expand and fuse at a



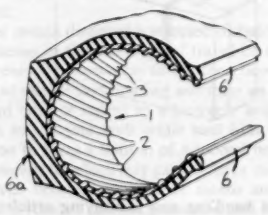
temperature that activates said adhesive, the expansion of said foam confining such shells within the space between each steam chest and its respective nest to thereby prevent the roughening of such shells by the expanding foam, such foam expansion also smoothing out any roughness present in the shells before expansion of the foam;
positioning non-skid material between said deck nest and said formed deck shell before said foam is expanded whereby said non-skid material is contiguously embedded within the upper surface of said deck shell when the foam is expanded;
removing said shells and their adhered fused plastic foam from said nests; and
then joining said shells whereby said fused plastic foam rigidifies said shells and also provides flotation for the completed boat hull.

4,065,338

RAW PNEUMATIC TIRE CARCASS AND METHOD OF FABRICATING SAME

Henri J. Mirtain, Compiegne, France, assignor to Uniroyal, Clairoix, France

Division of Ser. No. 509,523, Sept. 28, 1974, Pat. No. 3,948,304. This application Nov. 3, 1975, Ser. No. 628,453
Claims priority, application France, Oct. 5, 1973, 73.35763
Int. Cl.² B29H *17/02*
U.S. Cl. 156—123 R **3 Claims**



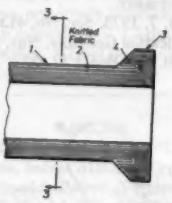
1. A method of fabricating a pneumatic tire, comprising:
a. forming an elastomeric, bead-reinforced, annular body;
b. forming an air-impervious, symmetrically convex, elastomeric liner for said body from a thermoplastic material so as to be coextensive with said body from bead-to-bead and present a convex surface that is thickest along the medial region of said liner;
c. forming on said convex surface of said liner an array of recesses each communicating one edge of said liner with a second edge;
d. superposing said liner co-extensively upon and affixing it to an internal surface of said body such that said liner recesses are exposed and said convex surface is annularly symmetrical;
e. inflating and vulcanizing said body and liner together by engaging a smooth surface of an inflatable medium with said convex surface in a heated mold;
f. venting fluid from between said liner and said inflatable medium via said recesses; and
g. treating an deforming the surface of said liner in which are presented said recesses such that the latter gradually disappear to merge smoothly with the remainder of said surface and present respective spaced striation marks evidencing their previously recessed condition and said convex liner is rearranged into a uniformly thick liner from bead-to-bead of said body concomitantly with said steps of inflation, vulcanization and fluid-venting.

4,065,339

PROCESS FOR PRODUCING FIBRE REINFORCED PLASTIC TUBES WITH FLANGES

Axel Lippert; Siegfried Joisten, and Johannes-Otto Sajben, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 324,043, Jan. 16, 1973, Pat. No. 3,920,049. This application Oct. 8, 1975, Ser. No. 620,894
Claims priority, application Germany, Jan. 18, 1972, 2202125
Int. Cl.² B32B *1/10*; B05D *3/12*
U.S. Cl. 156—149 **6 Claims**



1. In a process for producing fibre-reinforced plastic tubes, wherein a fabric tube is continuously knitted and coated with a duroplastic material in free-flowing form, and the duroplastic material is subsequently hardended, the improvement for providing the tubes with flanges, which comprises halting the application of duroplastic material to the knitted tube for a period of time in which a piece of knitted fabric sufficient for the production of two flanges is produced, cutting the uncoated piece of knitted fabric in the middle to provide two uncoated end portions of knitted fabric and forming a flange from each of said end portions by stretching each end portion radially outwardly, impregnating each stretched end portion with duroplastic material, and allowing the duroplastic material to harden.

4,065,340

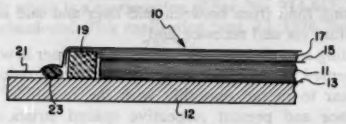
COMPOSITE LAMINATION METHOD

George E. Dickerson, Yorktown, Va., assignor to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 28, 1977, Ser. No. 792,067
Int. Cl.² B32B *31/06, 31/16*
U.S. Cl. 156—154 **11 Claims**

1. A process of preparing structural components of composite laminates comprising:

providing prepreg resin impregnated fiber tape material having the fibers therein running the length of the tape,
cutting the prepreg tape into a plurality of desired lengths,
stacking the plurality of lengths of tape in layers to a predetermined thickness while maintaining the same fiber orientation for each layer,
partially curing the stacked tape assembly into a unitary mass under vacuum for approximately ten minutes and at an elevated temperature of at least 350° F.,
cooling the partial cured mass and cutting it into a plurality of strips along the parallel orientation of the fibers,



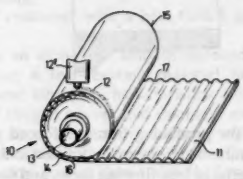
stacking this plurality of strips vertically in layers atop each other with two strips of uncured prepreg tape disposed between each of the plurality of laminate strips,
curing the stacked layer strips into a unitary structure under vacuum, pressure and an elevated temperature of at least 350° F. for least thirty minutes,
cooling the cured structure to a minimum of 150° F. while maintaining the pressure and vacuum, and after allowing to cool to room temperature,
machining the unitary structure formed into the final desired size and shape.

4,065,341

METHOD OF MAKING A LIQUID FILTER

Fritz Cub, Schwabach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 7, 1973, Ser. No. 413,634
Claims priority, application Germany, Nov. 21, 1972, 2256995
Int. Cl.² B65H *81/00*
U.S. Cl. 156—187 **7 Claims**



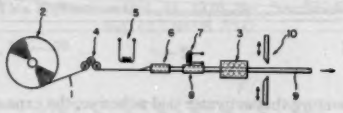
1. A method of making a liquid filter having a filtering roll which is fastened to a housing part, is itself made of a spiral of filtering material wound on a central tubular member, and is to be axially traversed by a liquid to be filtered, the method comprising, in combination:
a. providing a spiral roll of filtering material on a central tubular member,
b. providing a housing member into which said roll is to be placed, said housing member defining an outer edge,
c. laying a first bead of thermoplastic material having a given softening point on an outer surface of said roll at least around the circumference of said roll in the vicinity of an end thereof,
d. pressing with cooled forming jaws said first bead in a warm state to an outside diameter larger than the inside diameter of said housing member,
e. inserting the roll partly into the housing member so that the first bead engages the outer edge of the housing member,
f. heating said housing member to raise its temperature above said given softening point of said thermoplastic material to soften said first bead on its circumference during further insertion of the roll into said housing member and, thereafter
g. cooling said housing member to solidify said thermoplastic material;
whereby a liquid filter is formed upon solidification of said thermoplastic material which acts as a glue and constitutes a tight, rigid connection between the housing member and the roll of filtering material.

4,065,342

METHOD AND APPARATUS FOR PRODUCING SYNTHETIC RESIN TUBE

Mikio Kobayashi, Takatsuki, and Isamu Nakano, Toyonaka, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 544,665, Jan. 27, 1975, Pat. No. 4,009,069.
This application Nov. 11, 1976, Ser. No. 741,129
Claims priority, application Japan, Jan. 28, 1974, 49-12089; Apr. 16, 1974, 49-42871
Int. Cl.² B29D *23/10*
U.S. Cl. 156—203 **7 Claims**



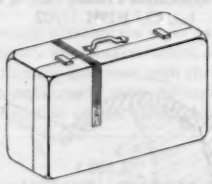
1. A method for producing a synthetic resin tube comprising the steps of transporting a strip of synthetic resin in its longitudinal direction, deforming the strip into a tubular shape having an axis extending in the longitudinal direction of the strip and at the same time bringing both lateral surfaces of the strip into pressing contact with each other to join said surfaces while passing the strip through a restricted space during transport, characterized in that the diameter of the restricted sapce is adjustable in accordance with the variation of the transverse dimension of the strip in its longitudinal direction by utilizing the internal stress of the strip passing therethrough.

4,065,343

LABEL SYSTEM FOR PACKAGE AND BAGGAGE HANDLING

Warren R. Stumpe, Glendale, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Continuation of Ser. No. 632,023, Nov. 14, 1975, abandoned.
This application Dec. 13, 1976, Ser. No. 750,343
Int. Cl.² B29C *17/08*; B65C *11/02*
U.S. Cl. 156—212 **9 Claims**



1. A method of handling and identifying articles such as luggage, packages, or the like, said method comprising the steps of:
a. printing both man-readable and machine-readable characters conveying information concerning each article on one side of a strap segment the other side of which is at least partially coated with an adhesive adapted to allow the strap segment to be temporarily affixed to the article and

subsequently to be removed in its entirety without leaving marks on the article and

b. affixing each strap segment to the article so that the characters appear on three sides of the article, whereby the characters can be read regardless of whether the article is standing up or has fallen over on one of its two principal sides,

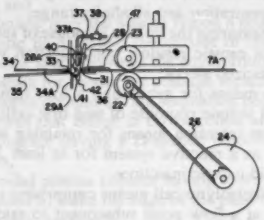
wherein one set of the man-readable characters is printed so that the characters are oriented in one direction with respect to the length of the strap segment, thereby being readable by a person standing on one side of the article, and another set of the man-readale characters is printed so that the characters are oriented at 180° to the first set of characters, thereby being readable by a person standing on the other side of the article, whereby the information concerning each article can be conveniently read regardless of the orientation which the article assumes during handling.

4,065,344

BAG FORMING METHOD AND APPARATUS

Herman C. Weist, Louisville, Ky., assignor to Weist Industries Inc., Louisville, Ky.

Filed June 25, 1975, Ser. No. 590,298
Int. Cl.² B31B *23/14, 23/60, 49/04*
U.S. Cl. 156—250 **5 Claims**



1. A bag forming apparatus including:

a. Feed means to selectively feed a substantially continuous elongate web of flattened tubular plastic stock material in a direction parallel to the longitudinal axis of the web;

b. Heat seal means extending across a portion of said web in a direction generally transverse to the direction of travel of the web to selectively fuse opposite sides of said web to form the bottom of a first bag;

c. First control means to selectively cause said heat seal means to contact said web to fuse said opposing sides of said web together along a line generally transverse to the direction of travel of said web to form a bottom of a first bag;

d. Feed means to move said web a selected distance along the direction of travel after the bottom of said first bag is formed;

e. Cutter means disposed a selected distance from said heat seal means in the direction of travel of said web along a line generally transverse to the direction of travel of the stock to release said first bag and form an opening thereto;

f. Second control means to selectively activate said cutter means to cut said web while said heat seal means is in position to form a bottom of a second bag;

g. Tear means to selectively exert a force on a tail portion of said web between said cutter means and said heat seal means to remove said tail portion of said web between said cutter means and said heat seal means while said heat seal means is in contact with said web; and

h. Cooler means disposed before said heat seal means relative to the direction of travel of said web to cool said web prior to introduction of said web to said heat seal means.

4. A method for formation of a plastic bag including:

a. feeding a substantially continuous elongate web of flattened tubular plastic stock material in a direction parallel to the longitudinal axis of the web;

b. fusing a portion of the upper and lower layers of said web along a line generally transverse to the direction of travel of the web to form a bottom of a first bag;

c. advancing said web a selected distance in the direction of travel thereof;

d. cutting the web along a line generally transverse to the direction of travel of the said web at a location a selected distance from the bottom of said first bag to form an open end of said first bag and generally simultaneously forming a heat seal transversely across a portion of said web a selected distance from said cut to form a bottom end of a second bag;

e. while fusing the upper and lower layers of said bottom of said second bag, exerting a force on a tail portion of said web between said bottom end of said second bag and said cut of said web to remove said tail portion from said web;

f. cooling the portion of said web to be fused prior to fusing said upper and lower layers.

4,065,345

POLYIMIDE ADHESIVES

Donald J. Progar, Grafton; Vernon L. Bell, Seaford, and Terry L. St. Clair, Poquoson, all of Va., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 532,784, Dec. 16, 1974, abandoned. This application Oct. 22, 1976, Ser. No. 734,901
Int. Cl.² C08K *5/06;* C08L *79/08;* C09J *3/00, 5/06*
U.S. Cl. 156—309 **6 Claims**

1. A method for preparing an adhesive solution comprising:

reacting an aromatic dianhydride with an approximately equimolar quantity of an aromatic diamine,

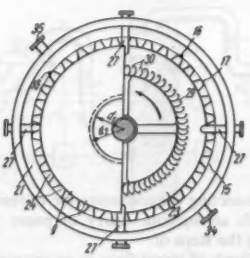
the reactants being previously dissolved in a liquid selected from the group consisting of 1,2-dimethoxyethane, bis(2-methoxyethyl)ether, 1,2,bis(2-methoxyethoxy)ethane and bis-[2-(2-methoxyethoxy) ethyl]ether.

4,065,346

ROTER THIN-FILM EVAPORATOR

Ivan Frolovich Evkin, bulvar Matrosa Zheleznyaka, 9a, kv. 78; Vladimir Alexandrovich Petrov, Tovarischesky pereulok, 17, kv. 16; Viktor Markovich Olevsky, Leningradsky prospekt, 75a, kv. 91; Vitaly Rafael-Abovich Ruchinsky, Prospekt Mira, 202, kv. 21; Vladimir Semenovich Bushev, Balaklavsky prospekt, 4, korpus 3, kv. 206, and Valentin Alexeevich Tatyanchikov, Universitetsky prospekt, 4, kv. 296, all of Moscow, U.S.S.R.

Filed Nov. 26, 1975, Ser. No. 635,771
Int. Cl.² B01D *1/22*
U.S. Cl. 159—6 R **6 Claims**



1. A rotor thin-film evaporator comprising: a cylindrical casing with an inner heat-exchange surface; heating jackets mounted outside the casing; a rotor including a shaft; a plurality of crimped drums arranged successively along said shaft;

bosses rigidly secured to said shaft, each of said crimped drums being secured to said bosses; each of said drums having peripheral surfaces with perforations therein for ejecting liquid fed to the crimps of said drums to the heat-exchange surface of said casing whereat steam is generated by vaporization of some of said liquid; an annular clearance being provided between the outer surface of each of the drums and the heat-exchange surface of the casing; means for uniformly distributing inlet liquid over the inner surface of the crimp bulges of the uppermost drum comprising a plate secured to the shaft of said rotor and covering the interior space of the drum from the top such that the steam is constrained to pass through said annular clearance; means for uniformly distributing liquid received from the uppermost drum successively to the inner surface of the crimp bulges of each of the lower drums; means for separating liquid drops from the stream of steam and liquid coming from said annular clearance at said uppermost drum comprising a section disposed between adjoining drums and including blades extending vertically and radially and having curvilinear cross-sections with vertical outer edges bent inwardly for discharge of separated liquid from the blades to said means for distributing the liquid to the inner surface of the crimp bulges of the lower drum while directing steam separated from liquid into the drum cavity.

4,065,347

METHOD OF PRODUCING FLUFFED PULP

Sven Ulrik Torbjörn Åberg, and Sven Gunnar Bergdahl, both of Molnlycke, Sweden, assignors to Molnlycke AB, Goteborg, Sweden

Filed Feb. 20, 1976, Ser. No. 659,919
Claims priority, application Sweden, Feb. 26, 1975, 7502156
Int. Cl.[2] D21B *1/06;* D21F *11/14*
U.S. Cl. 162—26 **7 Claims**

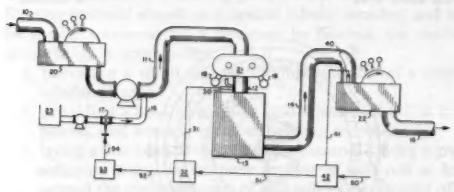
1. Method of producing fluffed pulp; characterized in that wood is defibrated and thereafter dried with warm air to a dry content of 80 –95% by weight without resorting to wet pulping or mechanical compression, thereby to produce a fluffed pulp comprising an unwashed mechanical pulp having a liquid diffusing capacity of at least 3.5 grams liquid per gram pulp and minute, a bulk of at least 18 cm^3/gram and a volume weight in blocks or bales of at most 0.8 g/cm^3.

4,065,348

METHOD AND APPARATUS FOR DETECTING AND CONTROLLING THE CAUSTIC IN PAPER PULP BLEACHING

William E. Zimmerman, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 570,666, April 23, 1975, abandoned. This application May 14, 1976, Ser. No. 686,305
Int. Cl.[2] D21C *7/12*
U.S. Cl. 162—49 **12 Claims**



1. A method of detecting the concentration of residual caustic in solution with an aqueous slurry of paper pulp, said method comprising the steps of:

A. Providing a slurry of wood fiber in an aqueous solution comprising chlorine and caustic within a ferrometallic container for said slurry;

B. Immersing a metallic material probe within said slurry as one pole of an electrolytic cell, said metallic material having a different tendency to ionize in said solution that iron and a consistent voltaic response to caustic concentration in said solution over a caustic residual concentration range of substantially 0.0 to 100.0 grams of caustic measured as sodium oxide per 100 liters of solution and an alkalinity range of substantially 7.0 to 11.0 pH;

C. Measuring between said probe and said container the electromotive force generated by the combination of said probe, said container and said slurry;

D. Correlating said electromotive force measurement to the concentration of residual, unreacted caustic in said solution as a function thereof.

9. An apparatus for regulating the flow of caustic compound into solution with a chlorinated aqueous slurry of paper pulp comprising:

A. A ferro-metallic conduit for a flow stream of said slurry;

B. A conduit for delivering a caustic compound into solution with said slurry flow stream at an injection point and at a rate sufficient to maintain within said solution a caustic residual concentration within the range of 0 to 100 grams of caustic measured as sodium oxide per 100 liters of solution and an alkalinity range of 7 to 11 pH.

C. Means for heating the causticized slurry above 170° F;

D. A first electrolytic cell means comprising said heated, causticized slurry as an electrolyte, said ferro-metallic conduit as a first cell pole and a second cell pole of metallic material having a different tendency to ionize in said causticized slurry than iron and also a consistent voltaic response in said heated, causticized slurry over said entire residual concentration and alkalinity range;

E. Means for measuring the voltaic response of said first cell to changes in caustic residual concentration within said heated, causticized slurry;

F. First signal means for generating a first signal porportional to said voltaic response of said first cell;

G. Flow stream retention means for retaining said causticized slurry as a reactive system for at least 30 minutes following said caustic injection;

H. A second electrolytic cell means comprising said causticized slurry at a flow point subsequent to said retention means as an electrolyte, said ferro-metallic conduit as a first cell pole and a second cell pole of metallic material having a different tendency to ionize in said causticized slurry than iron and also a consistent voltaic response to said causticized slurry over said entire residual concentration and alkalinity range;

I. Means for measuring the voltaic response of said second cell to changes in caustic residual concentration within said causticized slurry;

J. Second signal means for generating a second signal proportional to said voltaic response of said second cell;

K. Means to compare said second signal to a setpoint reference signal to derive a first error signal;

L. Means to compare said first signal to said first error signal to derive a second error signal; and,

M. Means to control the flow rate of caustic into said flowing slurry as a function of said second error signal.

4,065,349

PAPER SIZING PROCESS

Mark E. Bateman, Woodridge, and Jeffrey T. Palmer, Roselle, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

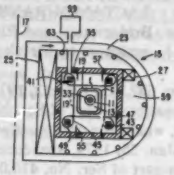
Filed Feb. 28, 1977, Ser. No. 772,917
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—158 **17 Claims**

1. A paper sizing process comprising (1) adding a sizing composition of a cationic retention aid and a monoester of a benzene carboxylic acid anhydride having from 6 to 60 carbon atoms in the ester group in a sizing amount to an aqueous pulp suspension or paper stock prior to web formation, (2) forming the web, and (3) heating said sized paper web at a temperature of from 80° to 150° C.

4,065,350
VERTICALLY STABILIZED ELONGATED CROSS-SECTION TOKAMAK

George V. Sheffield, Hopewell, N.J., assignor to The United States Government as represented by the Department of Energy, Washington, D.C.

Filed July 9, 1974, Ser. No. 486,926
Int. Cl.[2] G21B *1/02;* H01J *7/14*
U.S. Cl. 176—3 5 Claims



1. In the method of confining and stabilizing a plasma current carrying toroidal plasma column in a tokamak having toroidal and poloidal coil means for producing toroidal magnetic surfaces along an equilibrium axis around an axis of rotation, the improvement, comprising the steps of:

a. producing a toroidal plasma column in the magnetic surfaces; and

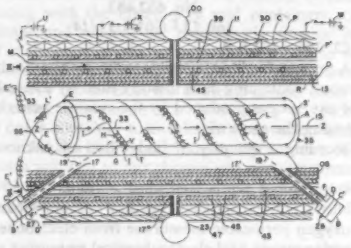
b. distributing over the plasma region a non-helical octupole magnetic field around the outside of the plasma column and in the space between the equilibrium axis and the axis of rotation for producing poloidal separatrices external to the plasma column having stagnation points and magnetic field lines that define in cross-section an elongated magnetic surface having a D-shaped poloidal divertor cross-section,

said toroidal plasma column having external shell currents computed to make the edge of the plasma region the $\Psi = 0$ magnetic surface.

4,065,351
PARTICLE BEAM INJECTION SYSTEM

Daniel L. Jassby, and Russell M. Kulsrud, both of Princeton, N.J., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 25, 1976, Ser. No. 670,480
Int. Cl.[2] G21B *1/02;* H01J *7/14*
U.S. Cl. 176—5 10 Claims



2. Method for injecting charges particles into a tokamak confining magnetic field, comprising:

a. Magnetically confining a neutral, toroidal plasma column of ions and electrons having a thermal temperature, density, volume, average thermal energy and average confinement time along an endless magnetic axis in a tokamak vacuum container means containing a toroidal magnetic field having concentric magnetic field lines of force forming a magnetic container that is concentric with the magnetic axis and capable of confining the plasma for a sufficient period of time to produce a thermal ion diffusion loss rate and a thermal electron diffusion loss rate;

b. injecting ordered, neutral, atomic beams having fast ordered ions and orbital electrons at densities that are directed into the confined plasma with trajectories that are generally tangent to the magnetic field lines and azimithally along the magnetic axis in the same and the opposite direction to the direction of the magnetic axis at an energy that is greater than the average thermal energy of the confined plasma, the neutral beams interacting with the confined thermal plasma ions to inject fast ions and thermal electrons into the plasma, the fast ions forming oppositely circulating, counterstreaming ion beams having directed, distinctly ordered, ion velocity distributions and associated beam currents that are oppositely displaced in velocity along the magnetic axis, the latter ion beams injecting thermal ions into the confined plasma due to the slowing down of the ion beams in the confined plasma;

c. the magnetic confinement maintaining the aforesaid thermal electron injection in balance with the thermal electron diffusion to maintain a thermal electron density in the confined plasma;

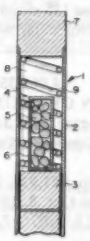
d. the magnetic confinement of the plasma also maintaining the directedness of the counterstreaming ion beams until the ions therein slow down to the average thermal energy of the confined plasma; and

e. removing the diffusing thermal electrons and the ions that slow down to the average thermal energy of the confined plasma, said removal being at least as fast as the average time it takes for the thermal ions to slow down to the average thermal energy of the confined plasma so as to maintain a high counterstreaming ion number density in the counterstreaming ion beams that is at least as great as the confined thermal ion density, said removal also maintaining the sum of the aforesaid counterstreaming ion number density and the confined thermal ion density substantially in balance with the confined electron density in the confined plasma so that the counterstreaming ion beams continuously produce a large number of head-on collisions between the counterstreaming ions all along the magnetic axis.

4,065,352
NUCLEAR FUEL ELEMENT

Yoshihiko Iwano, and Katsumi Une, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed June 9, 1976, Ser. No. 694,381
Claims priority, application Japan, June 13, 1975, 50-70748
Int. Cl.[2] G21C *3/02*
U.S. Cl. 176—68 3 Claims



1. In a nuclear fuel element constructed by sealing nuclear fuel material in a cladding tube, the improvement which comprises a hydrogen getter formed of hydrogen-absorbing metal material enclosed in a hydrogen-permeable metal member which does not allow the passage of water, oxygen and other gases fitted into the cladding tube, whereby the hydrogen-

absorbing metal material is prevented from having the surface coated with a protective film.

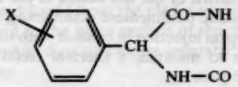
4,065,353

METHOD FOR THE PREPARATION OF D-CARBAMYL AMINOACIDS AND THE CORRESPONDING D-AMINOACIDS

Francesco Cecere; Giuliano Galli; Gino Della Penna, all of Monterotondo, and Bruno Rappuoli, Rome, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed May 11, 1976, Ser. No. 685,318
Int. Cl.[2] C12D *13/06*
U.S. Cl. 195—2 4 Claims

1. A method for the preparation of D-carbamyl aminoacids comprising the steps of subjecting to enzymatic hydrolysis in the presence of a hydropyrimidine hydrolase and a racemic mixture of compounds having the formula:



wherein X represents —OH, hydrocarbon radicals, halogen, alkoxyl, $—NO_2$, carboxyls, at a pH between 8 and 9.

4,065,354

LYSOZYME CONJUGATES FOR ENZYME IMMUNOASSAYS

Edwin F. Ullman, Atherton, and Kenneth E. Rubenstein, Menlo Park, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 513,662, Oct. 10, 1974, Pat. No. 3,905,871, and Ser. No. 481,022, June 20, 1974, abandoned, each is a continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned. This application Sept. 19, 1975, Ser. No. 615,152
The portion of the term of this patent subsequent to Sept. 16, 1992, has been disclaimed.
Int. Cl.[2] G01N *31/14;* C07G *7/02*
U.S. Cl. 195—63 12 Claims

1. An enzyme conjugate of lysozyme of the formula:

$$LYS\ (X—R—Y)_n$$

wherein:

LYS intends lysozyme;

n is the average number of groups bonded to the LYS and is in the range of 1 to 5;

X is a bond or non-oxocarbonyl, including the nitrogen and sulfur analogs thereof;

R is a linking group of from 1 to 12 carbon atoms and 0 to 3 heteroatoms which are oxygen, sulfur or nitrogen; and

Y is a hapten of at least 125 molecular weight and not greater than about 1,200 molecular weight.

4,065,355

PURIFICATION OF DEOXYRIBONUCLEASE

Boen Tie Khouw, Islington, and Johan Peter Kesler, Rexdale, both of Canada, assignors to Canada Packers Limited, Toronto, Canada

Continuation of Ser. No. 561,921, March 25, 1975, abandoned. This application Oct. 8, 1976, Ser. No. 730,739
Int. Cl.[2] C07G *7/02, 7/026*
U.S. Cl. 195—66 R 5 Claims

1. A process for the preparation of purified deoxyribonuclease from an impure source material thereof comprising, dissolving an impure deoxyribonuclease material in a buffer solution having a pH between about 3.5 and 9.0 and containing calcium ions, clarifying the resulting solution, applying the clarified solution to a column consisting essentially of concanavalin A chemically bound to agarose, the purity of the deoxyribonuclease in said solution being sufficiently high that there is substantial adsorption of deoxyribonuclease on the column, washing said column with buffer solution to remove impurities more loosely bound than deoxyribonuclease, eluting the adsorbed deoxyribonuclease from the column by contacting it with a carbohydrate solution, and recovering a purified deoxyribonuclease from said carbohydrate solution.

4,065,356

PRODUCTION OF ANTIBIOTIC FR-02A (EFROTOMYCIN) BY STREPTOMYCES LACTAMDURANS

William M. Maiese, Bridgewater, and Richard G. Wax, Matawan, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 657,512, Feb. 12, 1976, Pat. No. 4,024,251, which is a continuation-in-part of Ser. No. 496,457, Aug. 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 436,425, Jan. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 410,067, Oct. 26, 1973, abandoned. This application Mar. 1, 1977, Ser. No. 773,245
Int. Cl.[2] C12D *9/14*
U.S. Cl. 195—80 R 11 Claims

1. A method of producing antibiotic FR-02A which comprises cultivating the microorganism *Streptomyces lactamdurans* NRRL 3802 in a fermentation broth containing a nutrient sodium composed of assimilable sources of carbohydrate, nitrogen, and inorganic salts wherein the nutrient medium contains between about 1% and 6% by weight of carbohydrate and between about 0.2% and 6% by weight of available nitrogen under aerobic conditions at a temperature in the range of from about 26° C. to 30° C. for a period of from about two to five days wherein in the pH of the aqueous nutrient medium is in the range of from about 6.0 to 8.0 and extracting the whole broth with a water immiscible polar organic solvent selected from the group consisting of methyl formate, ethyl formate, methyl acetate, ethyl acetate, n-butyl acetate, isobutyl acetate, ethyl propionate, cyclohexanone, chloroform, methylene chloride, carbon tetrachloride, ethylene dichloride, 1-chloro-2,2-dimethylpropane, tetrachloroethylene, and bromoform to obtain the antibiotic FR-02A.

4,065,357

DETECTION OF CATALASE-CONTAINING BACTERIA

James N. Groves, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 434,999, Jan. 21, 1974, abandoned, which is a division of Ser. No. 886,283, Dec. 18, 1969, Pat. No. 3,838,034, which is a continuation-in-part of Ser. No. 723,179, April 22, 1968, abandoned. This application Nov. 17, 1975, Ser. No. 632,483
Int. Cl.[2] G01N *31/14*
U.S. Cl. 195—103.5 R 4 Claims

1. A process for the clinical detection of the catalase activity in catalasa-containing cells in body fluid by dynamic monitoring of oxygen gas produced by the catalase-peroxide reaction comprising the steps of:

a. secruing a quantity of body fluid of unknown catalase content,

b. intorducing a predetermined volume of said body fluid into a non-expandable reaction volume separated by an oxygen permeable membrane from electrochemical measuring means, said electrochemical measuring means being in association with said oxygen permeable membrane said means being totally outside said closed reaction volume, said membrane being impermeable to hydrogen peroxide and having an oxygen permeability coefficient of at least about 5×10^{-11} gms./atmos.-cm.-sec.,

c. introducing a predetermined quantity of hydrogen peroxide solution into said reaction volume such that the volumes of said body fluid and hydrogen peroxide solution completely fill said reaction volume and such that the resulting solution has a hydrogen peroxide concentration

in the range of from 0.01 to 1 mole per liter of said resulting solution, closing said reaction volume and

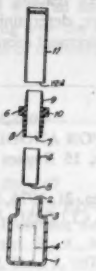
d. electrochemically measuring the increase of partial pressure of oxygen in said reaction volume by measuring the extent of diffusion of oxygen through said membrane, said extent of diffusion of oxygen through said membrane being linearly proportional to said partial pressure of oxygen in said reaction volume.

4,065,358

APPARATUS FOR PRODUCING REACTIONS IN COLORIMETRIC CELLS

Shoji Kawai; Kenichi Nishimura, both of Kyoto, and Mitsuo Fukuda, Ibaragi, all of Japan, assignors to Kabushiki Kaisha Kyoto Daiichi Kagaku, Japan

Filed May 10, 1976, Ser. No. 684,918
Claims priority, application Japan, May 17, 1975, 50-58847
Int. Cl.[2] C12K *1/10*
U.S. Cl. 195—127 **15 Claims**



1. In an apparatus for determining a property of a given sample, an outer container having an open top, an inner container also having an open top and being small enough to be received entirely within the outer container with both of said open tops directed upwardly and with the open top of said inner container being situated substantially below the open top of said outer container, a tubular colorimetric cell having opposed ends one of which is closed and the other of which is open, and tubular connecting means having opposed open ends and an unobstructed, completely open internal tubular passage extending from one to the other of said open ends and having an internal cross sectional area which is too small to receive said inner container, said tubular connecting means being removably connected with said open top of said outer container and said open end of said cell for fluid-tightly connecting said cell to said outer container with the interior of said cell communicating with the interiors of said containers so that when a sample and reagent are respectively situated in the interiors of said containers in an amount according to which the inner container when situated within the outer container will extend above the level of the contents of said outer container, said connecting means can fluid-tightly connect said cell to said outer container to enable both containers and said cell to be inverted as a unit for discharging the contents of both containers into said cell to mix therein and provide a reaction according to which a property of said sample may be measured in an instrument.

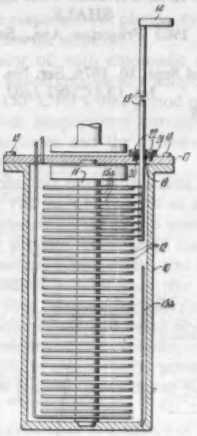
4,065,359

CELL REMOVING DEVICE

William M. Hurni, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 573,712, May 1, 1975, abandoned. This application July 6, 1976, Ser. No. 702,819
Int. Cl.[2] C12K *9/00, 1/10*
U.S. Cl. 195—127 **13 Claims**

1. Apparatus for removing cells from cell culture apparatus having a plurality of discs mounted on a central shaft, the cell removing apparatus comprising a substantially shaft-like member having mounted thereon substantially perpendicularly to the axis of the shaft-like member a plurality of spaced apart contacting members, each contacting member adapted to contact at least part of the surface of a disc, each contacting member having two arms, each arm attached separately to the shaft-like member, the arms being joined a distance removed from the shaft-like member whereby the contacting member is



substantially triangular in shape having its base at about the shaft-like member and its apex a distance removed from the shaft-like member, and each contacting member being moved directly upon rotation of the shaft-like member.

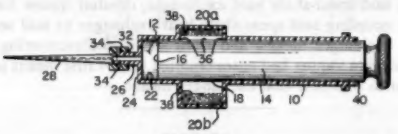
9. A method of physically removing cells from a disc on which the cells have been cultured comprising the step of positioning a contacting member described in claim 1 on at least part of the surface of the disc and rotating the contacting member and the disc relative to each other.

4,065,360

CULTURING SYRINGE DEVICE

Robert J. Kreb, III, Rolling Road, Skillman, N.J. 08558

Continuation-in-part of Ser. No. 678,851, April 21, 1976. This application July 30, 1976, Ser. No. 710,769
Int. Cl.[2] C12K *1/04*
U.S. Cl. 195—139 **8 Claims**



1. A culturing syringe device for withdrawing the fluid to be cultured directly into a sterile sealed culturing environment comprising:

a. a hollow housing defining a syringe chamber therein;

b. at least one closed culturing cavity defined in the lateral walls of said housing to be selectively openable into said syringe chamber, each said closed cavity having culturing media therein;

c. a movable piston located within the syringe chamber and adapted for longitudinal sliding movement therein, said piston including a head area and a peripheral area, said peripheral area providing a sealing means to selectively seal hermetically said closed culturing cavities from said syringe chamber and from the ambient environment;

d. hollow nipple means in one end of said housing providing fluid flow communication between said housing and the external environment; and

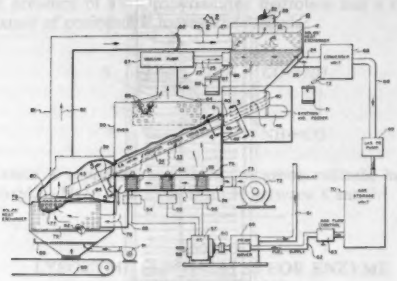
e. hollow needle means detachably affixed to said nipple means to allow fluid flow communication with the external environment.

4,065,361

APPARATUS AND SYSTEM FOR PROCESSING OIL SHALE

Lester Hanson, 1903 Princeton Ave., Salt Lake City, Utah 84108

Filed Sept. 10, 1976, Ser. No. 721,946
Int. Cl.[2] C10G *1/02*
U.S. Cl. 196—98 **7 Claims**



1. Oil shale processing apparatus including, in combination, a microwave oven having a continuous throughput conveyor passing through said oven and provided with a feed and a discharge end, said conveyor ends being disposed on opposite sides of and exterior with respect to said oven, first means coupled to said oven for applying a negative pressure therein said for withdrawing vapors and gases from the interior of said oven, an input hopper, first and second heat exchanger means disposed between said hopper and said conveyor feed end, said first heat exchanger being coupled to said first means for preheating incoming oil shale ore by said withdrawn vapors and gases as said oil shale passes from said hopper through said first heat exchanger means to said conveyor feed end, said second heat exchanger means being proximate to and operably separate from said first heat exchanger means to additionally preheat said incoming oil shale, a spent-shale heat exchanger disposed underneath said discharge end of the conveyor for heating air with spent shale, an air blower in communication with said spent-shale heat exchanger, conduit means for airflow coupling said spent-shale heat exchanger to said second heat exchanger means, and third means for recovering said withdrawn vapors and gases coupled to said first means subsequent to said first heat exchanger means.

4,065,362

PURIFICATION OF ORGANIC ISOCYANATES

Yushin Kataoka; Tetsuo Harada, and Kenji Takagi, all of Niihama, Japan, assignors to Sumitomo Bayer Urethane Co., Ltd., Japan

Filed June 2, 1975, Ser. No. 582,803
Claims priority, application Japan, June 4, 1974, 49-63592
Int. Cl.[2] B01D *3/34*
U.S. Cl. 203—58 **21 Claims**

1. A process for purifying an organic isocyanate which comprises heating an organic isocyanate in admixture with at least one treating agent selected from the group consisting of a metal salt of mercaptobenzothiazol, a metal salt of alkyl substituted dithiocarbamic acid, an alkyl substituted phenol, a thiobis-phenol, and a triaryl phosphite at a temperature not lower than 100° C. to thereby convert coloring impurities to tar and subsequently distilling the thusly treated mixture to recover a purified organic isocyanate.

4,065,363

PROCESS FOR THE ELECTROMETRIC MEASUREMENT OF CYANIDE IONS IN SOLUTIONS CONTAINING METAL IONS

Gunther Herrmann, Furth, Germany, assignor to Photocircuits Division of Kollmorgen Corporation, Hartford, Conn.

Filed Dec. 6, 1971, Ser. No. 205,297
Claims priority, application Germany, Dec. 17, 1970, 2064822
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T **1 Claim**

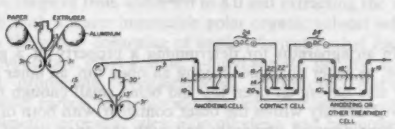
1. A process for the determination of the cyanide ion content of a solution which comprises cyanide ions, a strong reducing agent, and a silver ion, said method comprising providing in said solution an amount of metal complexer in excess of that required to complex the silver ion; providing in contact with said solution a cyanide ion selective electrode that has connected thereto, direct reading potentiometric measurement means and, thereafter, determining from said direct reading potentiometric measurement means the cyanide ion concentration.

4,065,364

PROCESS FOR ANODIZING ALUMINUM

Howard A. Fromson, 15 Rogues Ridge Road, Weston, Conn. 06880

Filed Jan. 21, 1976, Ser. No. 651,018
Int. Cl.[2] C25D *11/04, 11/16*
U.S. Cl. 204—15 **4 Claims**



1. In a process wherein aluminum foil is anodically oxidized, the improvement which comprises bonding a member narrower than the aluminum foil to one side thereof, encapsulating said member by coating, prior to anodizing, the bonded side of the aluminum foil with a polymeric material which is inert to the anodizing conditions and thereafter electrolytically anodizing the uncoated side of said aluminum foil.

4,065,365

METHOD FOR IMPROVING FRICTIONAL SURFACE IN CYLINDERS OR SLEEVES OF INTERNAL COMBUSTION ENGINES

Juan Retolaza Ibarguengoitia, Bilbao, Spain, assignor to Aplicaciones Industriales de Cromo Duro, S.A., Bilbao, Spain

Continuation-in-part of Ser. No. 559,649, March 18, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,602
Int. Cl.[2] C25D *7/04, 5/36, 5/50, 5/52*
U.S. Cl. 204—25 **10 Claims**

1. A method for preparing a chromium plated surface which comprises machining a metal base material to a smooth finish of up to 10 micro-inches CLA, chromium plating the machined surface, heat treating the chromium plated surface at a temperature between 150° and 325° C for 1 to 3 hours, cooling the heated surface in air, honing the cooled surface to remove irregularities from said surface, and lapping or blasting the honed surface with abrasive grit to obtain a surface finish between 25 and 50 micro-inches CLA.

2. A method according to claim 1, wherein the chromium plated surface is a chromium plated cylinder or sleeve suitable for use in an internal combustion engine.

4,065,366

PROCESS FOR PRODUCING ALKALI METAL HYDROXIDE

Yoshio Oda; Manabu Suhara, and Eiji Endo, all of Yokohama, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed Sept. 29, 1976, Ser. No. 728,017
Claims priority, application Japan, Oct. 17, 1975, 50-124275
Int. Cl.[2] C25B *1/16, 1/26, 13/08*
U.S. Cl. 204—98 10 Claims

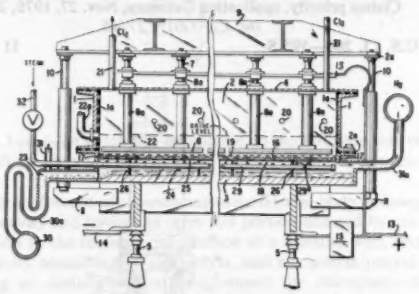
1. In a process for producing an alkali metal hydroxide which comprises electrolysis of an aqueous solution of an alkali metal chloride in an electrolytic cell having an anode compartment and a cathode compartment which are partitioned by a fluorinated cation exchange membrane, the improvement which comprises a fluorinated cation exchange membrane made of a fluorinated copolymer having carboxylic acid groups as the ion exchange group and having an ion exchange capacity of 0.5 to 2.0 meq/g dry polymer and concentration of carboxylic acid groups of 8 to 30 meq/g water absorbed by the membrane when contacted with an aqueous solution of the alkali metal hydroxide having aout the same concentration of alkali metal hydroxide as that of catholyte during said electrolysis.

4,065,367

METHOD OF OPERATING AN ELECTROLYSIS CELL

Vittorio de Nora, Nassau, Bahamas, assignor to Oronzio de Nora Impianti Elettrochimici, S.p.A., Milan, Italy

Division of Ser. No. 530,012, Dec. 5, 1974, Pat. No. 3,976,556.
This application Apr. 28, 1976, Ser. No. 681,145
Int. Cl.[2] C25B *1/16, 1/26*
U.S. Cl. 204—98 11 Claims



1. The method of reducing the caustic film concentration on the cathode side of the diaphragms of electrolysis cells having an anode compartment, a cathode compartment, an anolyte in the anode compartment, a catholyte in the cathode compartment, a diaphragm separating said compartments, screen anodes and cathodes in said compartments, and means to conduct an electrolysis current to said anodes and from said cathodes, which comprises maintaining a volume of anolyte in the anode compartment larger than the volume of anolyte in the gap between the anode and cathode, circulating anolyte through said screen anodes and out of said cells, passing an electrolysis current between said anodes and cathodes, introducing steam into the cathode compartment, maintaining the anode compartment below the condensation temperature of the steam in the cathode compartment under steady state operation throughout the electrolysis process by said circulation, condensing steam on the cathode side of the diaphragms, dripping the condensate and the caustic film removed from the cathode side of the diaphragms into the bottom of the cathode compartment and recovering the catholyte liquor.

4,065,368

PRINTED CIRCUIT COVER COATING COMPRISING AN ULTRAVIOLET RADIATION SENSITIVE ACRYLIC RESIN

Kenneth Allan Holtzman, Clifton, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 23, 1976, Ser. No. 660,473
Int. Cl.[2] C08F *2/46;* C08L *91/00*
U.S. Cl. 204—159.23 8 Claims

1. Method for the preparation of photopolymerizable acrylic resin which comprises the steps of:

a. esterifying castor oil with chlorendic anhydride in the presence of an amine catalyst at a temperature within the range of 120°–150° C for a time period ranging from 16–2 hours, the lower temperatures corresponding with the longer reaction times and the converse, so yielding a chlorendic anhydride half ester,

b. admixing the resultant ester with a cure retardant, from 5 to 20 parts per 100 parts of resin of an acrylic functional monomer selected from the group consisting of methyl acrylate, butyl acrylate, ethyl hexyl methacrylate, alkyl acrylate, and methyl methacrylate, and a reagent having acrylic functionality, selected from the group consisting of glycidyl acrylate, glycidyl methacrylate and a mixture of glycidyl methacrylate and butyl glycidyl ether, said reagent being employed in an amount sufficient to assure that at least 50% of the carboxyl groups present in the ester system are reacted therewith, so yielding an acrylic ester, and

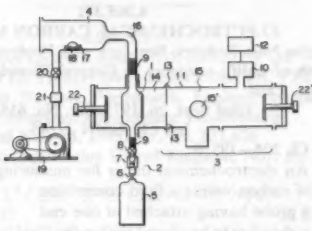
c. exposing the acrylic ester to a source of ultraviolet radiation for a time peroid sufficient to effect curing thereof.

4,065,369

ACTIVATED GAS REACTION APPARATUS & METHOD

Kazuyuki Ogawa; Masahiko Hirose, both of Yokohama; Masahiro Shibagaki, Hiratsuka; Yoshio Murakami, Yokohama, and Yasuhiro Horiike, Naritanishi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed July 15, 1976, Ser. No. 705,694
Claims priority, application Japan, July 18, 1975, 50-87235
Int. Cl.[2] B01K *1/00;* H01T *19/04*
U.S. Cl. 204—164 10 Claims



1. An activated gas reaction process comprising:

conducting feed gas to an activation chamber,

activating the feed gas in the activation chamber by applying microwave power to the feed gas from a microwave source under the conditions which satisfy the following formula:

$$2\pi fpl \geq 4 \times 10^9$$

where:

f = frequency of microwaves in Hz,

p = gas pressure in the activation chamber in torr,

l = length of the activation chamber in cm. extending in the direction in which the electromagnetic field is provided by the microwave source,

conducting the activated gas delivered from the activation

chamber to a reaction chamber apart from the activation chamber and,

reacting the activated gas with a non-gaseous material in the reaction chamber.

5. An activated gas reaction apparatus which comprises:

an activation chamber;

a reaction chamber apart from said activation chamber;

feeding means for conducting feed gas to the activation chamber; and

microwave power-generating means for activating the feed gas in the activation chamber.

4,065,370

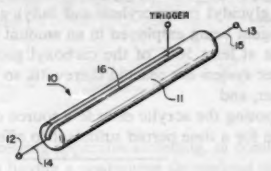
METHOD OF ION PLATING A THIN METALLIC STRIP FOR FLASHLAMP STARTING

Lowell Noble, Monte Sereno, and James T. Gaspar, San Jose, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 663,058, Nov. 18, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,438

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 N **3 Claims**



1. A method of insuring triggering of a laser flashlamp by application of an electrical impulse to an elongated metal strip permanently affixed to the outer surface of the quartz envelope of said flashlamp, comprising the steps of forming said metal strip by masking said flashlamp envelope to leave exposed an elongated region of said envelope, ion plating onto said exposed region of said envelope a thin layer of silver, and ion plating onto said plated layer of silver a thin layer of nickel.

4,065,371

ELECTROCHEMICAL CARBON METER

Douglas Noss Rodgers, San Jose, and Prodyot Roy, Saratoga, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Sept. 26, 1975, Ser. No. 616,941

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 R **14 Claims**

1. An electrochemical meter for measuring the concentration of carbon within a fluid comprising:

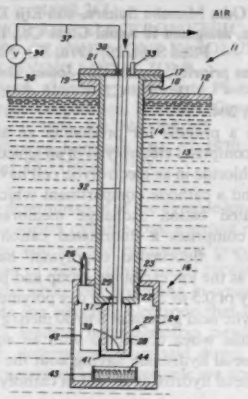
a. a probe having attached at one end

b. a chamber to be placed within the fluid having the carbon concentration to be measured with the interior of said chamber being physically separate from said fluid and the wall of said chamber including a diffusion membrane transparent to any free carbon within said fluid;

c. a carbon activity gas within said chamber containing a plurality of carbon containing compounds which will react with any free carbon therein and equilibrate;

d. an electrochemical cell within said chamber being physically separate from said fluid, said electrochemical being capable of generating an electrical potential proportional to the amount of carbon activity in said carbon activity gas; and

e. fixing compound means in said chamber for maintaining a level of concentration of one of said carbon containing compounds in said carbon activity gas with any variations in such concentration depending only on the amount of free carbon in the gas whereby variations in the carbon activity in said gas are proportional to the amount of free



carbon diffusing into said carbon activity gas through said diffusion membrane.

4,065,372

ELECTROCHEMICAL OXYGEN SENSING ELEMENT, PARTICULARLY FOR DETERMINATION OF OXYGEN CONTENT IN THE EXHAUST GASES OF AUTOMOTIVE INTERNAL COMBUSTION ENGINES

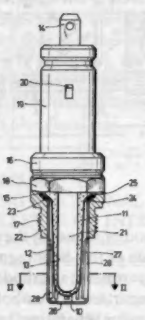
Wolf-Dieter Hacker, Asperg; Karl-Hermann Friese, Leonberg; Leo Steinke, Waiblingen-Hegnach, and Helmut Weyl, Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 27, 1976, Ser. No. 736,253

Claims priority, application Germany, Nov. 27, 1975, 2553292

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 S **11 Claims**



1. Electrochemical oxygen sensing element to determine the oxygen content in the exhaust gases from internal combustion engines having a housing (16, 17, 18, 19);

a solid electrolyte tube (11) having a first end closed at the bottom (10) and having an opposite end mounted in the housing and projecting therefrom, the solid electrolyte tube forming a solid ion conductive electrolyte oxygen concentration measuring element;

first electrode means (13) at the inside of the tube (11) extending into the region of the closed bottom thereof;

means (20) formed in the housing providing access of ambient air to the inside of the solid electrolyte tube (11) to establish an oxygen reference potential;

second electrode means (12) at the outside of the tube (11)

and forming a catalyzing layer, connected to a terminal of said element;

and a protective tube (22) surrounding the solid electrolyte tube, with clearance, and secured in the housing formed with opening therein to expose the outside of the tube (11) with said catalyzing layer (12) to the exhaust gases;

wherein, in accordance with the invention,

means are provided formed on the protective tube to establish a substantially uniform temperature gradient of the solid electrolyte tube, when said solid electrolyte tube is exposed to hot exhaust gases from the internal combustion engine including

said openings (27) formed in the protective tube (22) having an increase in cross-sectional free area

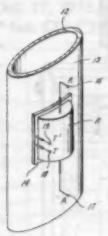
in the direction from the housing towards the bottom of the solid electrolyte tube, the largest open area of the openings (27) being approximately in the region of the closed region of the closed bottom (10) of the solid electrolyte tube (11) so that the area of said openings in the vicinity of the end of the tube in the housing has a smaller cross-section than the openings in the vicinity of the closed end.

4,065,373

HYDROGEN PATCH CELL

Richard L. Martin, Brentwood, and Eddie C. French, Manchester, both of Mo., assignors to Petrolite Corporation, St. Lous, Mo.

Filed Apr. 26, 1976, Ser. No. 680,024
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 C **17 Claims**



1. A hydrogen patch cell mountable on the diffusion side of a metallic wall being penetrated by hydrogen atoms, comprising:

a. a body formed of an insulating material, said body defining a cavity and having an open end portion adapted to conform to the surface configuration of a metallic wall, said cavity containing an electrolyte, said electrolyte providing an electrochemical environment for conversion of hydrogen atoms to hydrogen ions and said body being impervious to said electrolyte;

b. securing means associated with said body for holding said end portion in engagement with the metallic wall;

c. sealing means on said body for providing a peripheral fluid-tight seal between said end portion and said metallic wall;

d. a noncorroding metal barrier adjacent said open end portion, said barrier being interposable between said cavity and said wall and separated from said wall only by pliant coupling material which substantially fills all voids between said barrier and said wall, said barrier being permeable to hydrogen atoms but inert and impermeable with respect to said electrolyte contained in said cavity; and

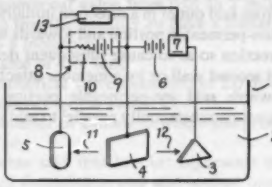
e. electrode means carried internally by said body and extending externally for connection to external circuitry whereby electrochemical conversion of hydrogen atoms to hydrogen ions is produced in said electrolyte and hydrogen diffusion is determined.

4,065,374

METHOD AND APPARATUS FOR PLATING UNDER CONSTANT CURRENT DENSITY

Hiroshi Asami, and Masao Kaji, both of Otsu, Japan, assignors to New Nippon Electric Co., Ltd., Osaka, Japan

Filed Mar. 29, 1977, Ser. No. 782,417
Claims priority, application Japan, Aug. 10, 1976, 51-95872
Int. Cl.[2] C25B *15/02*; C25D *21/12*
U.S. Cl. 204—228 **8 Claims**



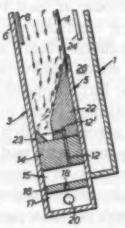
1. A plating apparatus comprising plating bath means for holding an electrolyte solution of uniform ionic concentration in said plating bath means, a common electrode plate, electrode support means for supporting articles to be plated and a standard or reference electrode, arranged relative to each other in said plating bath, first plating circuit means including a direct electric current source connected between said common electrode and said electrode means to be plated; said direct electric current source being able to supply a plating current of variable strength, second circuit means including constant direct current source means connected between said common electrode plate and said standard or reference electrode plate, resistance change detecting means operatively arranged to detect the change of electric resistance in the electrolyte solution between said common electrode plate and said standard or reference electrode plate in response to the change in the electric potential difference between said common electrode plate and said standard or reference electrode plate caused by the constant current which flows therethrough, and control circuit means operatively connected for regulating the plating current strength supplied by said direct electric current source in order to maintain a constant plating current density in response to the output of said detecting means.

4,065,375

APPARATUS FOR PROVIDING FLOW OF ELECTROLYTE THROUGH ELECTROLYTIC CELLS

Alan Frank Roy Newton, Portsmouth, England, assignor to Parel Societe Anonyme, Luxembourg, Luxembourg

Filed Nov. 13, 1975, Ser. No. 631,676
Claims priority, application United Kingdom, Nov. 13, 1974, 49184/74
Int. Cl.[2] C25B *15/08*; C25D *21/10, 17/00*
U.S. Cl. 204—237 **26 Claims**



1. An electrode system comprising a vessel bounded by a first wall including an ion-permeable portion and by a second

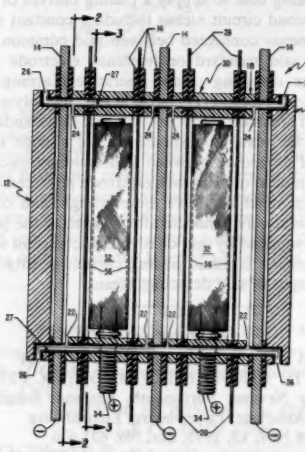
wall opposite said first wall; a current feeder within said vessel spaced apart from said ion-permeable portion; and a plurality of electrically conductive particles free to move within a region between the current feeder and the ion-permeable portion and constituting, in use, a particulate electrode, said vessel incorporating at the base thereof a flow distributor means for discharging fluid into said vessel which comprises at least one channel debouching into the interior of the vessel, the end portion of each channel remote from the base of the cell being an outlet which is directed so as to discharge said fluid directly into said vessel from said outlet in a direction initially generally away from said ion-permeable portion and towards said second wall and in a direction so as to cause subsequent deflection of said fluid by said second wall or by a member attached to said second wall towards said ion-permeable portion and then upwardly in a direction substantially parallel to said ion-permeable portion.

4,065,376

ELECTROLYTIC CELL

Andrew Whyte; William A. Gallup, both of Painesville; Barry A. Schenker, Mayfield Heights, and Robert A. Schulz, Euclid, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed May 4, 1976, Ser. No. 683,027
Int. Cl.² C25B *9/00, 13/00, 15/08*
U.S. Cl. 204—263 **6 Claims**



1. An electrolytic cell comprising: at least two end plates; a first electrode in sealing engagement with one of said end plates; a first electrode compartment frame in sealing engagement with said first electrode; at least two channels within opposing ends of said first electrode compartment frame of distribute an electrolyte solution evenly across said first electrode entire surface; slots milled transverse to the axis of each of said channels to provide further opening into the interior of said first electrode compartment frame to enhance the jetting action of the electrolyte across said first electrode; a planar separator in sealing engagement with said first electrode compartment; a second electrode compartment frame containing inlet and outlet ports for circulation of electrolyte solution and sealingly engaged with said planar separator; a second electrode element contained with the confines of said second electrode compartment frame; and means for impressing an electric current between said first electrode and said second electrode element.

4,065,377

METAL ANODE FOR ELECTROCHEMICAL PROCESSES

Christine Zollner, Schwaig near Nurnberg; Gerhard Thiele, Uttenreuth uber Erlangen; Dieter Zollner, Schwaig near Nurnberg, and Konrad Koziol, Rothenbach an der Pegnitz, all of Germany, assignors to C. Conradty Nurnberg GmbH & Co. KG, Germany

Continuation-in-part of Ser. No. 516,996, Oct. 22, 1974, Pat. No. 3,991,158. This application Nov. 1, 1976, Ser. No. 737,548
Int. Cl.² C25B *11/04;* C25D *17/00;* C01G *15/00*
U.S. Cl. 204—290 F **5 Claims**

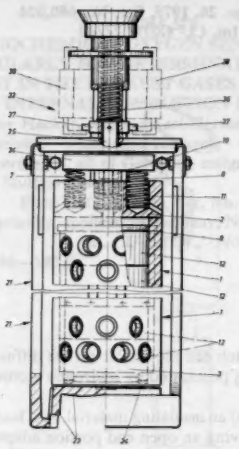
1. In an anode for electrochemical processes which anode comprises a basis metal and a cover layer, the improvement wherein said cover layer comprises cardinal-red cubic face centered thallium palladate having the formula $TlPd_3O_4$.

4,065,378

MOUNTING MAGAZINE FOR A GALVANIC FIXTURE FOR ELECTROPLATING SEMICYLINDRICAL ARTICLES

Friedrich Sauer, Heidenrod, and Klaus Muller, Naurod, Taunus, both of Germany, assignors to Glyco-Metallwerke Daelen & Loos GmbH, Wiesbaden-Schierstein, Germany

Filed Nov. 17, 1975, Ser. No. 632,847
Int. Cl.² C25D *17/06, 17/08*
U.S. Cl. 204—297 W **8 Claims**



1. Apparatus for containing a stacked end to end column of semi-cylindrical articles during electroplating comprising a galvanic holding fixture adapted for mounting and providing electrical contact in a galvanic bath system and a magazine that is open along one side; said holding fixture comprising a fixture head, a fixture body connected at one end to said fixture head and adapted to be laid over the open side of said magazine, a platform at the other end of said body, and means for maintaining said magazine under longitudinal pressure between said head and said platform; and said magazine having a magazine body wall of electrically insulating material of generally half-cylindrical cross section formed with a multiplicity of openings located in staggered arrangement over the entire length and circumference of said magazine body wall for through flow of electrolyte, with opposite longitudinal side edges of said wall defining said open side of the magazine and being so disposed as to laterally support the column of semi-cylindrical articles by engagement with the outer convex surfaces of all of said articles, a bottom section supporting said column with said articles in said lateral engagement with said side edges and with the concave surfaces of said articles facing away from said longitudinal opening, and a head section having means

providing electrical contact under longitudinal pressure to the other end of said column.

4,065,379

PROCESS FOR THE PRODUCTION OF NORMALLY GASEOUS OLEFINS

Homi D. Soonawala, and Steven E. den Broeder, both of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 14, 1976, Ser. No. 648,983

Claims priority, application United Kingdom, Jan. 22, 1975, 2831/75

Int. Cl.[2] C07C *11/04;* C10G *13/06, 9/16*

U.S. Cl. 208—67 11 Claims

1. A process for the production of normally gaseous olefins from a petroleum residue, which comprises subjecting the petroleum residue to a thermal cracking treatment, recovering a gas oil fraction by distillation from the product of the thermal cracking treatment, catalytically hydrotreating at least a substantial part of the gas oil fraction, steam-cracking at least a substantial part of the hydrotreated product and recovering normally gaseous olefins from the effluent thus obtained.

4,065,380

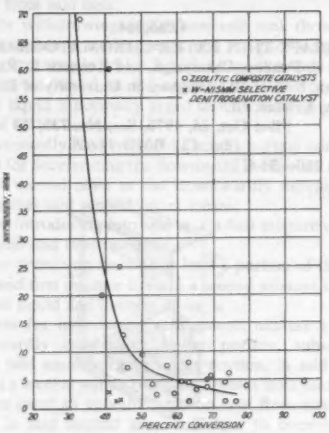
HYDRODENITRIFICATION USING A TUNGSTEN CONTAINING NI-SMM COMPOSITE CATALYST

Harold E. Swift, Gibsonia, and Roger F. Vogel, Butler, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 17, 1975, Ser. No. 623,377

Int. Cl.[2] C10G *23/02*

U.S. Cl. 208—89 8 Claims



FIGURE—DENITROGENATION CURVE FOR NI-SMM-HY COMPOSITE CATALYST, USING TUNGSTEN OR NICKEL TUNGSTEN. CURVE IS DRAWN THROUGH CIRCLES.

1. A process for the hydrodenitrification of a charge stock containing at least 350 ppm of organic nitrogen which comprises

contacting said charge stock under hydrodenitrification conditions including a temperature from 400° to 950° F. with a non-zeolitic catalyst consisting essentially of

i. from 60 to 92 weight percent of a laminar 2:1 layer-lattice aluminosilicate mineral possessing layer-lattice unit cells, each cell having an inherent negative charge balanced by cations exterior to said unit cell, said mineral corresponding to the following overall formula prior to drying and calcining:

$$[(Al_{4-w}{}^{3+}Y_{3x}{}^{2+})^{IV}(Q_{8-x}{}^{4+}Al_x{}^{3+})^{IV}O_{20}(OH)_{4-f}F_f]\cdot[dC]$$

where Al is aluminum;

Y is selected from the class consisting of nickel, cobalt and mixtures thereof;

Q is at least 0.95 mol fraction silicon ions, the remainder consisting of tetravalent ions having an ionic radius not to exceed 0.65 A; and

F is fluorine;

C is at least one charge-balancing cation; and where *e* has a numerical value from 2 to 3 inclusive;

w has a numerical value from 0.01 to 2 inclusive, with the proviso that the quantity *ew* have a numerical value from 0.02 to 4 inclusive;

f has a value of 4 or less;

x has a numerical value from 0.05 to 2.0 inclusive;

y is the valence of the cation C;

d is the number of cations C where the product $dy = x + 3(e-2)w$;

and wherein said first bracket represents said layerlattice unit cell formulation and said second bracket represents said charge-balancing cations; and

ii. tungsten in the form of metal oxide or metal sulfide or a mixture thereof dispersed through said semicrystalline laminar 2:1 layer-lattice aluminosilicate mineral component in an amount from 5 to 30 weight percent of said catalyst, calculated as the metal;

to obtain a product containing less than 10 ppm of nitrogen and wherein less than 50 weight percent of said product boils at a temperature substantially below the boiling range of the charge stock.

4,065,381

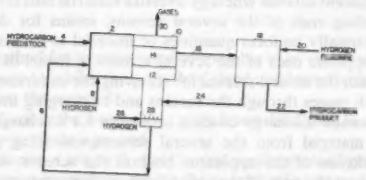
MAINTAINING EFFECTIVE MOLAR RATIO OF HF TO METAL PENTAFLUORIDE IN A HYDROCARBON CONVERSION PROCESS

Geoffrey R. Say; William C. Baird, Jr., and Paul W. Kamienski, all of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 29, 1976, Ser. No. 758,053

Int. Cl.[2] C07C *5/28, 9/00, 3/12;* C10G *35/06*

U.S. Cl. 208—134 9 Claims



1. In a hydrocarbon conversion process which comprises

1. converting a hydrocarbon feedstock with a substantially liquid phase acid catalyst comprising (a) a metal pentafluoride selected from the group consisting of tantalum pentafluoride, niobium pentafluoride and mixtures thereof, and (b) hydrogen fluoride, such that the reaction effluent from said process is separated in a settling zone into a hydrocarbon phase containing minor amounts of metal pentafluoride and a catalyst phase;

2. removing at least a portion of the metal pentafluoride from the hydrocarbon phase by contact with a solvent comprising substantially anhydrous liquid hydrogen fluoride, thereby forming a hydrocarbon phase depleted in metal pentafluoride and an extract phase containing hydrogen fluoride and the metal pentafluoride thus removed, the molar ratio of hydrogen fluoride to metal pentafluoride in said extract phase being greater than that desired in said hydrocarbon conversion process, the improvement which comprises maintaining the molar ratio of hydrogen fluoride to metal pentafluoride in the extract phase at the level desired in said hydrocarbon conversion

process while inhibiting the deactivation of the catalyst phase by:

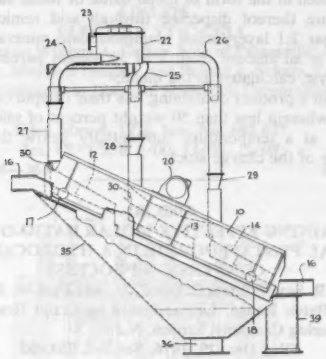
3. combining at least a portion of said extract phase with said catalyst phase in said settling zone to form a catalyst mixture and stripping said mixture with a gas containing molecular hydrogen for a time sufficient to reduce the molar ratio of hydrogen fluoride to metal pentafluoride in said catalyst mixture to the level desired in said hydrocarbon converting step (1); and
4. passing at least a portion of said stripped catalyst mixture from step (3) to said converting step (1).

4,065,382

MULTIPLE SCREEN APPARATUS

H. William Derrick, Jr., Williamsville, N.Y., assignor to Derrick Manufacturing Corporation, Buffalo, N.Y.

Filed June 16, 1976, Ser. No. 696,584
Int. Cl.² B07B *1/28*
U.S. Cl. 209—313 **6 Claims**



1. Screening apparatus comprising a plurality of screens in generally end-to-end relation but with spaces between the ends of adjacent screens whereby oversize material falls from corresponding ends of the several screens, means for depositing substantially uniform quantities of material to be screened at the opposite ends of the several screens, a funnel-like hopper beneath the several screens for receiving the undersize material which passes through the screens and converging the same to a common discharge conduit, a conduit for discharging oversize material from the several screens extending generally lengthwise of the apparatus beneath the screens, and guide means at the ends of the several screens for receiving oversize material falling therefrom for converging such material in a lateral direction and directing the same into said discharge conduit, said oversize material discharge conduit being substantially narrower than the width of said screens to permit the undersize material to fall past said conduit to said hopper.

4,065,383

PROCEDURE AND MEANS FOR COLLECTING LIQUID CONTAINING RADIOACTIVE TRACER ELEMENTS

Helge Skare, Heggtoppen, P.O. Box 8, 3401 Lierbyen, Norway, and Henry Hirschberg, Studentbyen pa Kringsja, Sognsveien 218, Oslo 8, both of Norway

Filed Apr. 1, 1976, Ser. No. 672,679
Claims priority, application Norway, Apr. 14, 1975, 751309
Int. Cl.² B01D *15/00, 35/00;* G01N *33/16*
U.S. Cl. 210—27 **7 Claims**

1. A method for collecting a given amount of liquid containing radioactive tracer elements from a container which also contains solid particles, in particular biological tissue, without at the same time collecting such particles, comprising the steps of

immersing an actively absorbing surface of a liquid absorbent body in said amount of liquid,

said surface covered with a filter permeable to said liquid, but not to said particles,

completely absorbing said amount of liquid in the liquid absorbent body through said filter,

subseqently separating said filter from said actively absorbing surface, and

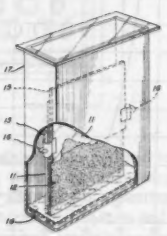
removing the absorbent body from the container after separation of the filter.

4,065,384

GRAFT THIN LAYER CHROMATOGRAPHY

Ramesh C. Pandey, Champaign, and Kenneth L. Rinehart, Jr., Urbana, both of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Oct. 26, 1976, Ser. No. 735,759
Int. Cl.² B01D *15/08*
U.S. Cl. 210—31 C **16 Claims**



9. A TLC plate system for graft thin-layer chromatography comprising:

a. a pair of lap-joined plates each of which plates comprises a rectangular supporting surface and an adsorbent layer thereon coating about 50% to about 90% of the surface of the supporting plate, the uncoated surface comprising at least one strip of uniform width along an end of the supporting plate; and

b. clamping means for securing the plates at the lap-joint formed when the uncoated strip of the first plate is placed over the adsorbent layer of the second plate in a manner such that the adsorbing layers of the two adjoining plates are in intimate contact along their entire length so as to permit a chromatogram developed initially on the first plate to be transferred, in part or in whole, onto the adsorbent layer of the second plate.

4,065,385

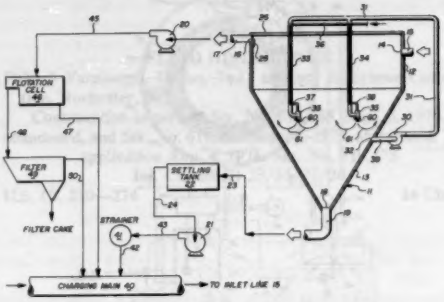
APPARATUS AND METHOD FOR SEPARATING A MIXTURE OF LIQUID AND COAL FINES

Ali I. Aktay, Munster, Ind.; Bohdan J. Bodnaruk, Homewood, Ill., and Michael O. Holowaty, Crown Point, Ind., assignors to Inland Steel Company, Chicago, Ill.

Continuation of Ser. No. 647,051, Jan. 7, 1976, abandoned. This application Dec. 13, 1976, Ser. No. 749,813

Int. Cl.[2] B03D *1/24*

U.S. Cl. 210—44 **12 Claims**



1. An apparatus for separating coal fines from a mixture of liquid and coal fines, said apparatus comprising:

a tank including an unconverging upper portion and a downwardly converging lower portion;

first outlet means for removing froth from the upper portion of said tank;

second outlet means at the bottom of said tank for removing liquid from said tank;

means for withdrawing liquid from said tank through said first and second outlet means and for providing in said tank a first zone in which liquid is urged toward said first outlet means and a second zone, below said first zone, in which liquid is normally urged downwardly toward said second outlet means;

said downwardly converging lower tank portion comprising means for accelerating the downward movement of liquid in said second zone as the downwardly moving liquid approaches said second outlet means;

means for introducing into said tank a first mixture comprising liquid and coal fines;

means for premixing air with at least a portion of the liquid from said first mixture to form a second mixture comprising said liquid and bubbles of air;

and means for introducing said second mixture into said downwardly converging lower portion, substantially below said unconverging upper portion, in said second zone at a level at which rising air bubbles from said second mixture exert an upward force on coal fines mixed with liquid in said second zone sufficient to overcome the downward urging of the liquid on the coal fines, for the acceleration the liquid undergoes at that level as a result of said downwardly converging lower tank portion, and to urge said coal fines at that level toward said first outlet means.

8. A method for separating, in a tank, coal fines from a mixture of liquid and coal fines, said method comprising the steps of:

providing a liquid-containing tank with an unconverging upper portion, a downwardly converging lower portion, a first outlet for removing froth from said upper portion of said tank and a second outlet for removing liquid from the bottom of the tank;

simultaneously withdrawing liquid from said tank through said first and second tank outlets at respective withdrawal rates which cooperate to provide, in the tank, a first zone in which said liquid is urged toward said first outlet and a second zone, below said first zone, in which said liquid is normally urged downwardly toward said second outlet;

accelerating the downward movement of liquid in said second zone as the downwardly moving liquid descends through said downwardly converging lower tank portion and approaches said second outlet;

introducing a first mixture of said liquid and said coal fines into said tank;

premixing air with at least a portion of the liquid from said first mixture, to form a second mixture comprising said liquid and air bubbles;

and introducing said second mixture into said downwardly converging lower portion, substantially below said unconverging upper portion, in said second zone at a level at which rising air bubbles from said second mixture exert an upward force on coal fines mixed with liquid in said second zone sufficient to overcome the downward urging of the liquid on the coal fines, for the acceleration the liquid undergoes at that level as a result of its descent through said downwardly converging lower tank portion, and to urge said coal fines at that level toward said first outlet.

4,065,386

ALGAE GROWTH CONTROL

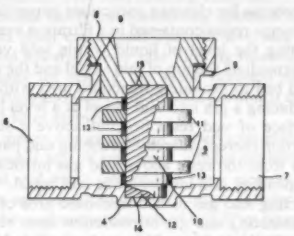
Robert Alexander Rigby, Canterbury, Australia, assignor to Algard Pty. Ltd., Balwyn, Australia

Filed June 16, 1976, Ser. No. 696,502

Claims priority, application Australia, Dec. 10, 1975, 4244/75

Int. Cl.[2] C02B *3/02*

U.S. Cl. 210—60 **6 Claims**



1. A method for treating water disposable in an open, uncovered storage to inhibit the growth of algae and bacteria therein comprising the steps of:

a. conducting the water along a predetermined path to open, uncovered storage; and

b. producing a magnetic field in said predetermined path of sufficient strength to inhibit the growth of algae and bacteria in said water.

4,065,387

SLIME CONTROL METHOD

Takao Tsuneki, Ebina; Norio Takahashi, and Hirohisa Tashiro, both of Yokohama, all of Japan, assignors to Kurita Water Industries, Ltd., Osaka, Japan

Filed May 5, 1976, Ser. No. 683,249

Claims priority, application Japan, May 14, 1975, 50-57691

Int. Cl.[2] C02B *1/36*

U.S. Cl. 210—62 **8 Claims**

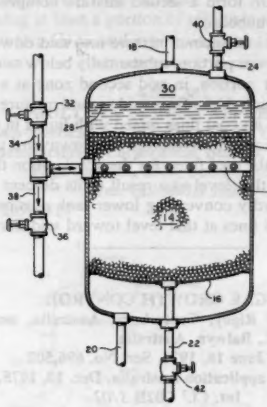
1. A method for reducing the amount of slime that adheres on solid surfaces in contact with a circulating stream of process water wherein said process water contains microorganisms capable of forming and depositing a slime on said surfaces, which comprises the step of: adding to said circulating stream of process water from 1 to 200 ppm of a water-soluble bromite compound selected from the group consisting of sodium bromite and potassium bromite so that said bromite compound is effective to reduce the adhesion of slime on said solid surfaces.

4,065,388

PROCESS FOR REMOVAL OF UNDISSOLVED IMPURITIES FROM ION EXCHANGE RESIN

George Flynn, Bridgewater Township, N.J., and Eli Salem, Brooklyn, N.Y., assignors to Ecodyne Corporation, Union, N.J.

Filed Mar. 3, 1976, Ser. No. 663,369
Int. Cl.[2] B01D *23/24*
U.S. Cl. 210—80 7 Claims



1. A process for cleaning particulate impurities from a bed of ion exchange resins contained in a filtration vessel, comprising:

adjusting the level of liquid within said vessel to a point intermediate the top of said vessel and the upper surface of said bed to provide a freeboard area within said vessel;

introducing a gas into said vessel at a level below the upper surface of said resin bed but above a substantial lower portion thereof, thereby scrubbing said particulate impurities from the resin above said gas introduction level and suspending said impurities in said liquid;

collecting said gas in said freeboard area of said vessel and terminating said gas introudction upon reaching a predetermined pressure within said vessel; and

draining a portion of said liquid containing said suspended mpurities from said vessel at a level generally equal to said gas introduction level.

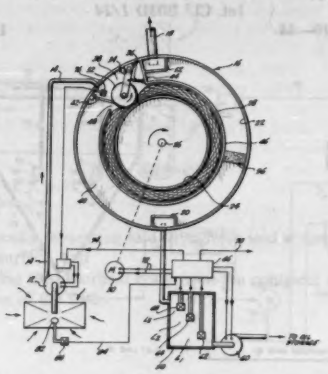
4,065,389

APPARATUS FOR DETECTING PROPORTION OF OIL IN OIL/WATER MIXTURES

Jay L. McGrew, Littleton, Colo., assignor to Marine Construction & Design Co., Seattle, Wash.

Filed Aug. 30, 1976, Ser. No. 718,799
Int. Cl.[2] B01D *15/02*
U.S. Cl. 210—96 R 2 Claims

1. Apparatus to detect presence of oil above a pre-determined proportion in water comprising separator means having output means with separate receiving compartments for the respective liquids, said separator means adapted for connection to a source of a mixture of such liquids and operable to transfer such mixture therefrom to said output means at a first substantially constant volumetric rate while separating the oil from the water for discharge thereof into their respective receiving compartments, rate responsive measurement means operatively associated with the receiving compartment for the oil, calibrated in relation to such first volumetric rate and operable during such transfer to detect and respond to rate of arrival of such separated oil in such latter receiving compartment exceeding a predetermined fraction of said first volumetric rate, said measurement means comprising pump means operable to transfer oil from said receiving compartment for the oil at a second substantially constant volumetric rate, a predetermined fraction of said first volumetric rate, and associated detector means operable to detect the condition of volumetric rate of separated oil entering said latter receiving compartment exceeding said second volumetric rate by sensing oil in said latter receiving compartment rising above a predetermined upper level therein during operation of said pump means, and energizing circuit means for such pump means including first



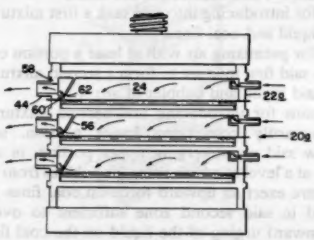
switch means operable to initiate operation of said pump means in response to level of oil in said latter receiving compartment rising above a predetermined second level, below said upper level, and second switch means operable to terminate operation of said pump means in response to level of oil in said latter receiving compartment dropping below a predetermined third level, below said second level.

4,065,390

PLATE TYPE FILTER APPARATUS

John R. Schneider, Belvedere, and Kenneth B. Klyver, Santa Rosa, both of Calif., assignors to J.R. Schneider Co., Inc., Tiburon, Calif.

Filed Feb. 7, 1977, Ser. No. 766,186
Int. Cl.[2] B01D *25/12*
U.S. Cl. 210—225 9 Claims



1. In a liquid filter comprising a plurality of separate plate assemblies, each having a central planar member with a downwardly extending peripheral skirt and an upwardly extending peripheral sidewall, said assemblies being stacked together with a layer of filter media between each pair of adjacent assemblies to form a closed upper liquid chamber on one side of the media, surrounded by a said peripheral skirt with inlets for liquid to be filtered in an inlet skirt portion and a lower chamber on the opposite side of said media surrounded by a said peripheral sidewall of another assembly and having outlets for filtered liquid in an outlet skirt portion, the improvement comprising:

a baffle means in each said plate assembly parallel to and spaced inwardly from one side of said peripheral skirt

having said inlets, said baffle means including a first elongated strip extending downwardly from the planar member of the plate assembly and means forming a series of openings along the bottom edge of said first elongated strip, said openings being spaced above said filter media and thereby enabling liquid to be blown out of the upper chamber back through said inlets so that said plate assemblies can be rapidly drained of liquid before being separated to change the filter media.

4,065,391

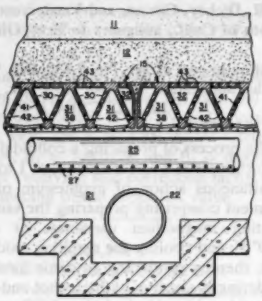
FLUID DISTRIBUTOR

Patrick Farabaugh, Dallas, Tex., assignor to Sybron Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 611,585, Sept. 8, 1975, abandoned, and Ser. No. 611,597, Sept. 8, 1975, abandoned. This application Aug. 4, 1976, Ser. No. 710,473

Int. Cl.[2] B01D *23/16, 23/20*

U.S. Cl. 210—274 **14 Claims**



1. In a system for distributing a liquid uniformly throughout a bed of granular media, including:

a distributor positioned beneath and supporting said media, said distributor being divided into primary horizontal conduits and secondary horizontal conduits that extend parallel to said primary horizontal conduits and containing liquid metering orifices that connect said primary conduits to said secondary conduits and dispersion orifices that connect said secondary conduits to said bed of granular media;

a flume extending transverse to said primary conduits and connected to each of said primary conduits; and

means for supplying a liquid to said flume, whereby said liquid flows from said flume to said primary conduits, through said liquid metering orifices into said secondary conduits, and through said dispersion orifices into said bed;

the improvement comprising:

a plurality of inclined walls separating said primary conduits from said secondary conduits, whereby said secondary conduits are positioned beside said primary conduits, said primary conduits have an upwardly tapering cross-section and said secondary conduits have a downwardly tapering cross-section;

gas metering orifices located at an intermediate level in said inclined walls and defining a gas flow passage above said gas metering orifices in said primary conduits, said liquid metering orifices being positioned beneath and separated from said gas metering orifices in said inclined walls; and

means for supplying a gas to said primary conduits, whereby said gas passes through said gas metering orifices into said secondary conduits and through said dispersion orifices into said bed.

4,065,392

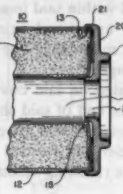
FILTER

Howard M. Gammon, 500 Brielle Road, Manasquan, N.J. 08736

Filed June 22, 1976, Ser. No. 698,511

Int. Cl.[2] B01D *27/02*

U.S. Cl. 210—282 **5 Claims**



1. A liquid filter element for use in stacks comprising an inner tubular center portion formed of a material permeable to said liquid;

an outer tubular sleeve portion formed of a material permeable to said liquid;

a first means for sealing the space between said inner tubular portion and said outer tubular portion at one end of said filter element;

a filtering material filling the space between said inner and said outer tubular portions;

said inner tubular center portion having tabs extending beyond the other end of said filter element, said tabs being folded outwardly over said filtering material;

said outer tubular sleeve portion having material extending beyond said other end of said filter element, said material being folded inwardly over said filtering material;

a second means for sealing the space between said inner tubular portion and said outer tubular portion at said other end of said filter element;

said second means comprising an impervious material impregnating said tabs of said inner tubular portion extending beyond said other end of said filter element and impregnating said material of said outer tubular portion extending beyond said other end of said filter element, and being molded to form a continuous seal between said material of said outer tubular sleeve portion and said material of said inner tubular center portion;

at least one continuous annular ridge in said second means extending above the surface of said impervious material and situated between said inner and said outer tubular portions and

said second means of one of said filter elements being seated against a first means of another of said filter elements, whereby said annular ridge of said second means of said one filter element will embed itself into said first means of said other filter element, to avoid by-pass of said liquid around said filter element.

4,065,393

CONICAL CENTRIFUGE WITH CONTINUOUS ACTION

Stoyan Hristov Sendov, Sofia; Ivan Angelov Nikolov, Vidin; Ivan Alexandrov Kuklin, Vidin, and Mircho Georgiev Mirchev, Vidin, all of Bulgaria, assignors to Chimkombinat, Vidin, Bulgaria

Filed July 26, 1976, Ser. No. 708,689

Claims priority, application Bulgaria, Aug. 2, 1975, 30711

Int. Cl.[2] B01D *33/02*

U.S. Cl. 210—377 **1 Claim**

1. A centrifuge for the separation of a liquid and a solid in a suspension of said solid in said liquid, said centrifuge comprising:

an upright cylindrical housing having a conical bottom formed with a discharge fitting for discharging said solid;

an inner cylinder disposed coaxially within said housing and

provided with a conical bottom having a discharge fitting for discharging liquid;

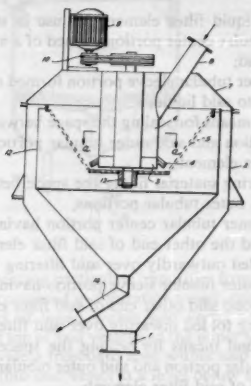
a cover closing said housing at the top thereof;

a generally cylindrical bearing box mounted on said cover and extending coaxially downwardly into said inner cylinder;

a single drive shaft journaled in said bearing box and having a lower end within said inner cylinder below said bearing box and an upper end extending above said cover said single shaft minimizing the requirement for seals within said centrifuge;

a motor mounted on said cover and operatively connected to said upper end of said shaft for driving same;

a rotor connected to said lower end of said shaft within said inner cylinder and formed with an upwardly diverging conical sieve reaching substantially to the top of said inner



cylinder whereby solids migrating over the upper edge of said sieve pass around said inner cylinder into the conical bottom of said housing while liquid traversing said sieve passes into the conical bottom of said inner cylinder;

a pipe coaxially surrounding said bearing box and spaced therefrom, said pipe being mounted on said bearing box at the lower end thereof by a plurality of generally flat vertical vanes, said vanes extending tangentially from the outer surface of the lower end of said bearing box to the inner surface of the lower end of said pipe;

a plurality of helical arc blades disposed on the lower end of the outer surface of said pipe; said vanes and blades cooperatively functioning to uniformly distribute said suspension over the inner surface of said conical sieve;

an inlet for said suspension opening into said pipe, said pipe being downwardly open toward said rotor at the bottom of said pipe.

4,065,394

INTUMESCENT FIRE RETARDANT MATERIAL

Richard D. Pratt, Cincinnati; Paul F. Proffitt, Reading, and George Webb, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 550,933, Feb. 19, 1975, Pat. No. 3,983,082. This application May 17, 1976, Ser. No. 687,101

Int. Cl.[2] B27K *3/00*

U.S. Cl. 252—8.1 **3 Claims**

1. An improved mixture of ingredients for use with a resin base in the formation of an intumescent fire retardant material, the mixture comprising four ingredients, by weight:

1–10 parts of an oxide of iron;
17–52 parts of a phosphate of potassium;
2–30 parts of a charring material; and
2–20 parts of a blowing agent.

4,065,395

ARYL DIUREA-THICKENED GREASES

Wayne W. Bailey, Gibsonia, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 6, 1976, Ser. No. 747,894

Int. Cl.[2] C10M *1/10, 3/02, 1/32, 3/26*

U.S. Cl. 252—25 **20 Claims**

1. A lubricating grease comprising a base oil of lubricating viscosity thickened to a grease with a mixture of aryl diureas obtained by reacting an aryl amine mixture of p-toluidine and p-chloroaniline with a toluene diisocyanate in the proportion of two moles of said aryl amine mixture per mole of said diisocyanate, the mole ratio of p-toluidine to p-chloroaniline in said aryl amine mixture ranging from about 3:1 to about 17:1.

16. A lubricating grease according to claim **1** which further includes a precipitated calcium carbonate in an amount ranging from about 1 to about 10 percent by weight of the total composition.

4,065,396

MAGNESIUM OXIDE PROCESS

Charles R. Dickey, Covina, and Vanderveer Voorhees, Los Altos, both of Calif., assignors to Bray Oil Co., Los Angeles, Calif.

Continuation-in-part of Ser. No. 9,488, Feb. 9, 1970, abandoned. This application Nov. 30, 1973, Ser. No. 420,625

Int. Cl.[2] C10M *1/40*

U.S. Cl. 252—33.4 **1 Claim**

1. In the process of preparing a colloidal dispersion of magnesium carbonate in a lower alcohol of 1 to 4 carbon atoms by the simultaneous action of magnesium oxide and CO_2, the improvement comprising preparing the said magnesium oxide by roasting magnesium carbonate at a temperature of 800°–900° F. and cooling the resulting oxide in the absence of moisture, thereby producing an oxide having a crystal structure rendering it reactive with alcohol and CO_2, then contacting said oxide with said alcohol and CO_2 and a temperature of about 80° to 200° F. to form said colloidal dispersion.

4,065,397

PLANIGRAPHIC X-RAY APPARATUS FOR THE PREPARATION OF TOMOGRAPHIC IMAGES

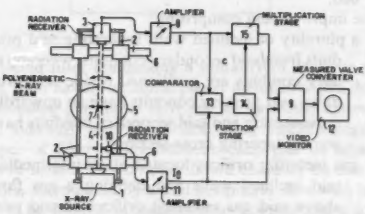
Ernst-Peter Ruhrnschopf, Erlangen, and Gerhard Linke, Erlangen-Frauenaurach, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 627,466, Oct. 30, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,204

Claims priority, application Germany, Dec. 9, 1974, 2458225; France, Aug. 8, 1975, 75.24840; United Kingdom, Aug. 12, 1975, 33623/75

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—445 T **2 Claims**



1. In a planigraphic X-ray apparatus for the preparation of tomographic images of an exposure object; including an X-ray measuring arrangement having an X-ray source generating an X-ray beam penetrating the exposure object, the cross-sectional expanse of said beam perpendicular to the planigraphic plane being equal to the plane thickness; a first radiation re-

ceiver for determining the radiation intensity of the X-radiation as a reference value preceding its ingress into the object; a second radiation receiver for determining the radiation intensity behind the object in the direction of the radiation as attenuated values through scanning of the projected X-ray beam at sequential equidistant points; a comparator for forming a measured magnitude from the reference and attenuated values; a drive means for the measuring arrangement including a pivot mounting for producing rotational movement of the X-ray measuring arrangement through small equidistant angular amounts about a rotational axis generally coincident with the symmetrical longitudinal axis of the exposure object in alternating sequence with respectively each scan; and a measured value converter for transforming the measured values into a tomographic image the improvement comprising: a function stage for forming, from the logarithm of the measured value y defined by the X-ray intensity I_0 in the ray direction preceding the exposure object and the X-ray intensity I behind the exposure object as the quotient, a correction factor C pursuant to the proximating function

$$C = \begin{cases} 1 + y \cdot (y - y_1) \cdot (A_0 + A_1 y) \text{ for } 0 \leqq y \leqq y_1 \text{ resp.} \\ 1 + (y - y_1) \cdot (B_0 B_1 \cdot y + B_2 \cdot y^2) \text{ for } y_1 \leqq y \leqq 10 \end{cases}$$

with counting values, dependent upon a selectable normalized radiation spectrum, of y_1, A_0; B_0; and B_2, said and counting values, at an X-ray tube voltage of 100 kV and a normalization spectral line at 51 keV, are $y_1 = 4.45$; $A_0 = -0.035$; $A_1 = 0.0039$; $B_0 = -0.04$; $B_1 = -0.0126$; and $B_2 = 0.00075$; and a multiplication stage receiving said correction factor C for the multiplicative influencing of the measured value.

4,065,398

LIQUID SOAP COMPOSITION

Hendrik Willem Brouwer, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 641,203, Dec. 16, 1975, abandoned, which is a continuation of Ser. No. 450,533, March 12, 1974, abandoned. This application Aug. 16, 1976, Ser. No. 714,450

Claims priority, application United Kingdom, Mar. 15, 1973, 12513/73; Sept. 24, 1973, 44624/73

Int. Cl.[2] C11D *9/02. 9/14, 17/08*

U.S. Cl. 252—108 **2 Claims**

1. An aqueous liquid sodium soap solution containing from 38% to 45% by weight of a sodium soap consisting essentially of a mixture of A) at least one sodium soap of C_8–C_{16} saturated fatty acid and B) at least one sodium soap of fatty acids selected from the group consisting essentially of C_{16}–C_{22} mono and C_{16}–C_{22} disaturated fatty acids and mixtures thereof, the ratio of A to B being from 4:1 to 1:4.

4,065,399

PROCESS FOR CONTROLLING A BONDING GAS SYSTEM

Franklin T. Osborne, Gulf Breeze, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 17, 1976, Ser. No. 724,038

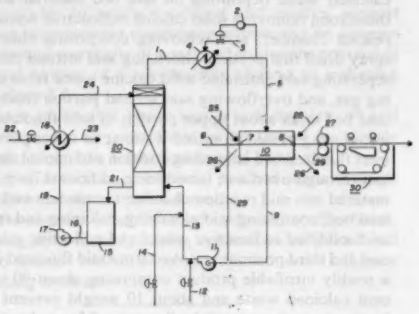
Int. Cl.[2] C09K *3/00*

U.S. Cl. 252—182 **5 Claims**

1. A process for controlling the temperature and composition of a bonding gas used for bonding a nonwoven web of continuous nylon filaments and for supplying said gas to a gas box at a temperature just above its dew-point, comprising the steps;

supplying a monitored concentration of liquid HCl, maintained at a predetermined temperature to a stripper column;

circulating an HCl-water-air mixture which contains a low volume percent of HCl through said stripper column so that said mixture evaporates a portion of the liquid HCl wherein the volume percent of HCl in said mixture is increased thereby forming a bonding gas having the desired HCl concentration;



controlling the temperature of said gas as it is drawn off the column so that said gas has an HCl concentration just above its dew-point; and

feeding said gas to a gas box.

4,065,400

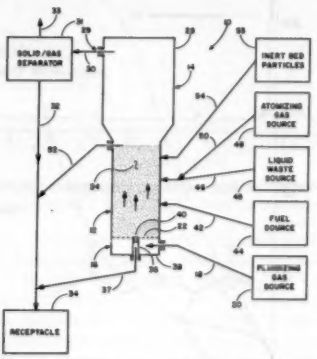
NUCLEAR WASTE SOLIDIFICATION

William J. Bjorklund, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 8, 1976, Ser. No. 675,086

Int. Cl.[2] G21F *9/14*

U.S. Cl. 252—301.1 W **4 Claims**



1. A process for continuously solidifying high level radioactive waste resulting from reprocessing irradiated nuclear reactor fuels anc containing virtually all of the nonvolatile fission products, several tenths of one percent of the uranium and plutonium originally in the irradiated fuels, and other actinides formed by transmutation of the uranium and plutonium as normally produced in a nuclear reactor, by using a fluidized inert bed having a minimal fission product inventory comprising introducing an inert particulate material comprising silica particles having an average particle diameter of from about 0.20 to about 0.40 mm into a chamber; heating said material to from about 400° to about 1300° C; dispersing air as a fluidizing gas beneath said material to agitate same and form a fluidized bed; atomizing said radioactive liquid waste; introducing said atomized waste into an upper portion of said heated, fluidized bed to effect calcination of said waste and formation of a fluidized inert bed with said atomized waste comprising from about 10 to about 15 weight percent calcined radioactive waste and from about 90 to 85 weight percent silica particles, a first

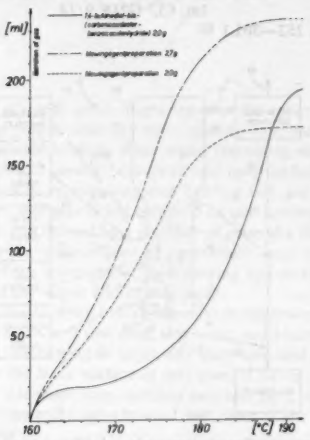
portion of said calcined waste being spray dried, a second portion of said calcined waste depositing and remaining on said particulate fluidized bed material, and a third portion of said calcined waste depositing on said bed material and attriting therefrom; removing solid calcine radioactive waste from said reactor chamber, said removing comprising elutriating said spray dried first portion, elutriating said attrited third portion, separating said elutriated solid calcine waste from said fluidizing gas, and overflowing said second portion from said fluidized bed at an about upper portion of said fluidized bed, said introducing of said atomized waste at an upper portion of said inert fluidized bed enhancing attrition and minimizing inert bed loss through overflow; introducing additional inert particulate material into said reaction chamber to maintain said inert fluidized bed; continuing said atomizing, calcining and removing of said solidified radioactive waste, and collecting said first, second and third portions removed from said fluidized inert bed as a readily vitrifiable product comprising about 90 weight percent calcined waste and about 10 weight percent silica, and having an average particle diameter of from about 0.1 mm to about 0.3 mm.

4,065,401

BLOWING AGENT MIXTURE

Wolfgang Cohnen, Leverkusen, and Gerhard Apel, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 22, 1975, Ser. No. 606,913
Claims priority, application Germany, Aug. 29, 1974, 2441418
Int. Cl.[2] C09K *3/00*; C08J *9/08*
U.S. Cl. 252—350 **3 Claims**



1. Blowing agent mixture consisting of from 85 - 60%, by weight, of 1,4-butanediol bis-(carbonic acid ester-benzoic acid anhydride) and from 15 - 40%, by weight, of silicon dioxide.

4,065,402

TALL OIL DEFOAMER FOR HIGH STRENGTH ACID MEDIA

William A. Satterwhite, Englishtown; Robert M. Leach, Cranbury, and Harold A. Stuhler, Browns Mills, all of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed Apr. 29, 1976, Ser. No. 681,621
Int. Cl.[2] B01D *19/04*
U.S. Cl. 252—358 **38 Claims**

1. A defoamer for controlling the foam in high strength acid media comprising a majority of a fatty acid and a minority of a long chain alcohol, said alcohol having from about 4 to about 20 carbon atoms, and the ratio of said alcohol to said fatty acid is from about 0.025:1 to about 0.75:1.

4,065,403

TALL OIL DEFOAMER HAVING A NONIONIC ADDITIVE DEFOAMER FOR HIGH STRENGTH ACID MEDIA

William A. Satterwhite, Englishtown; Robert M. Leach, Cranbury, and Harold A. Stuhler, Browns Mills, all of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed June 15, 1976, Ser. No. 696,242
Int. Cl.[2] B01D *17/04*
U.S. Cl. 252—358 **47 Claims**

1. A defoamer for controlling the foam in high strength acid media comprising a majority of a sulfonated fatty acid and a minority of a nonionic additive having the formula R—O(R-'—O)$_n$R'' [R-O(R')$_n$R''] wherein R' is hydrocarbyl [alkylene oxide], R and R'' is hydrocarbonyl or hydroxyhydrocarbyl, and *n* is an integer of from 1 to about 200.

4,065,404

TALL OIL DEFOAMER FOR HIGH STRENGTH ACID MEDIA

William A. Satterwhite, Englishtown; Robert M. Leach, Cranbury, and Harold A. Stuhler, Browns Mills, all of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed June 15, 1976, Ser. No. 696,241
Int. Cl.[2] B01D *17/04*
U.S. Cl. 252—358 **56 Claims**

1. A defoamer for controlling the foam in high strength acid media comprising a majority of a sulfonated fatty acid and a minority of a long chain alcohol, said alcohol containing from about 4 carbon atoms to about 20 carbon atoms, and a nonionic additive having a formula [R—O(R')$_n$R''] R—O(R'—O)$_n$R'' wherein R' is a, hydrocarbyl, R is hydrocarbyl or hydroxyhydrocarbyl, R'' is hydrocarbyl or hydroxyhydrocarbyl, and *n* is an integer of from 1 to about 200.

4,065,405

RECOVERY OF TANTALUM AND/OR NIOBIUM PENTAFLUORIDES FROM A HYDROCARBON CONVERSION CATALYST

Roger Hulme, Somerville, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 3, 1976, Ser. No. 747,091
Int. Cl.[2] B01J *27/32*; C07C *3/54, 5/28*; C10G *35/06*
U.S. Cl. 252—415 **14 Claims**

1. In a hydrocarbon conversion process which comprises contacting a hydrocarbon feedstock with a substantially liquid phase acid catalyst comprising (a) a metal pentafluoride selected from the group consisting of tantalum pentafluoride, niobium pentafluoride, and mixtures thereof and (b) hydrogen fluoride, thereby forming a hydrocarbon phase and a catalyst phase, said catalyst phase having become at least partially deactivated due to the formation of catalytically less active complexes with at least a portion of the metal pentafluoride, the improvement which comprises recovering at least a portion of the metal pentafluoride component of the catalyst according to the steps comprising

1. distilling said catalyst at a temperature ranging from about 70° to about 400° C. in the presence of a Lewis acid selected from the group consisting of the trihalides of aluminum, the tetrahalides of titanium, zirconium, hafnium and mixtures thereof to form the metal pentahalide of the catalyst component, and
2. contacting the metal pentahalide thus formed with hydrogen fluoride in an amount sufficient to convert at least a portion of said metal pentahalide to the corresponding metal pentafluoride, thereby recovering the metal pentafluoride component of the catalyst possessing a lower level of said catalytically less active complexes than that possessed by the metal pentafluoride component of said deactivated catalyst.

6. In a hydrocarbon conversion process which comprises contacting a hydrocarbon feedstock with a substantially liquid

phase acid catalyst comprising (a) a metal pentafluoride selected from the group consisting of tantalum pentafluoride, niobium pentafluoride, and mixtures thereof and (b) hydrogen fluoride, thereby forming a hydrocarbon phase and a catalyst phase, said catalyst phase having become at least partially deactivated due to the formation of catalytically less active complexes with at least a portion of the metal pentafluoride, the improvement which comprises recovering at least a portion of the metal pentafluoride component of the catalyst according to the steps comprising:

1. stripping at least a portion of the hydrogen fluoride from said partially deactivated catalyst,
2. extracting the uncomplexed metal pentafluoride from the residue of step (1) with a liquid hydrocarbon,
3. distilling said catalyst at a temperature ranging from about 70° to about 400° C in the presence of a Lewis acid selected from the group consisting of the trihalides of aluminum, the tetrahalides of titanium, zirconium, hafnium and mixtures thereof to form the metal pentahalide of the catalyst component, and
4. contacting the metal pentahalide formed in step (3) with hydrogen fluoride in an amount sufficient to convert at least a portion of said metal pentahalide to the corresponding metal pentafluoride, thereby recovering the metal pentafluoride component of the catalyst possessing a lower level of said catalytically less active complexes than that possessed by the metal pentafluoride component of said deactivated catalyst.

11. In a hydrocarbon conversion process which comprises contacting a hydrocarbon feedstock with a substantially liquid phase acid catalyst comprising (a) a metal pentafluoride selected from the group consisting of tantalum pentafluoride, niobium pentafluoride, and mixtures thereof and (b) hydrogen fluoride, thereby forming a hydrocarbon phase and a catalyst phase, said catalyst phase having become at least partially deactivated due to the formation of catalytically less active complexes with at least a portion of the metal pentafluoride, the improvement which comprises recovering at least a portion of the metal pentafluoride component of the catalyst by distilling said catalyst at a temperature ranging from about 70° to about 400° C in the presence of a Lewis acid selected from the group consisting of aluminum fluoride, the tetrafluorides of titanium, zirconium, hafnium and mixtures thereof to form the metal pentafluoride component of the catalyst which possesses a lower level of said catalytically less active complexes than that possessed by the metal pentafluoride component of said deactivated catalyst.

4,065,406
CATALYST FOR USE IN TREATING GAS

Atsushi Nishino; Kazunori Sonetaka, and Kunio Kimura, all of Neyagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 23, 1976, Ser. No. 651,739
Claims priority, application Japan, Jan. 29, 1975, 50-12859
Int. Cl.[2] B01J *27/20, 23/76*
U.S. Cl. 252—443 **14 Claims**

1. A catalyst comprising a mixture of from 45 to 75% by weight of manganese dioxide, from 15 to 25% by weight of calcium aluminate, from 5 to 15% by weight of iron oxyhydroxide and from 2 to 10% by weight of copper hydroxycarbonate.

4,065,407
PROCESS FOR PREPARING SHAPED PARTICLES FROM REHYDRATABLE ALUMINA

William Edward Bambrick, Old Greenwich, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 16, 1976, Ser. No. 723,835
Int. Cl.[2] B01J *21/04*
U.S. Cl. 252—463 **7 Claims**

1. In a method for producing shaped alumina particles suitable for use as catalysts and catalyst supporting comprising preparing an aqueous slurry of an alumina composition containing a substantial portion of a rehydratable alumina, shaping the alumina into desired form, rehydrating to harden the shaped alumina, and curing, drying, and calcining the shaped alumina particles to produce catalyst and catalyst support material, an improvement comprising introducing an aqueous slurry consisting essentially of water and an alumina containing a substantial portion of a rehydratable alumina to a shaping medium selected from

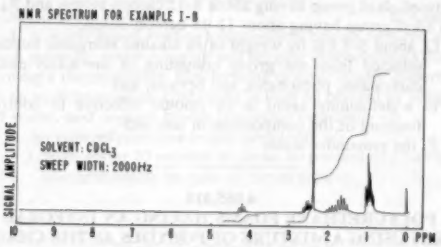
a. a water immiscible phase into which droplets of said alumina slurry are introduced to be shaped by surface tension forces into a spherical beaded form, and
b. tubing of desired cross-sectional size and shape to shape said alumina into extrudate form,

whereby the alumina is fashioned into a desired configuration, and applying heat to said shaping medium to rehydrate and harden the alumina while it is being subjected to the influence of the shaping medium.

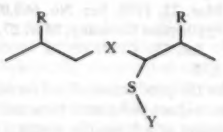
4,065,408
α-OXY(OXO) SULFIDE PERFUME AND COLOGNE COMPOSITIONS

William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, both of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Frederick Louis Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sept. 15, 1976, Ser. No. 723,534
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 **12 Claims**

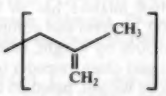


1. A perfume comprising a carrier and a compound having the structure:



wherein R is one of hydrogen or methyl, X is a moiety having the structure:

and Y is selected from the group consisting of methyl, methallyl, having the structure:



1-propyl, 2-methyl-1-propyl and acetyl.

4,065,409

HARD SURFACE DETERGENT COMPOSITION

John J. Flanagan, Chicago, Ill., assignor to Corporate Brands, Inc., Chicago, Ill.

Filed Aug. 1, 1975, Ser. No. 601,054
Int. Cl.[2] C11D *1/62, 1/75, 1/835, 3/075*
U.S. Cl. 252—528 6 Claims

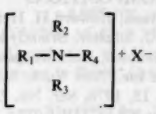
1. A detergent concentrate composition comprising:

A. about 1.5–2.0% by weight of a non-ionic detergent which is a condensation product of about 8–16 moles of ethylene oxide with one mole of a compound selected from the group consisting of

1. an alkyl phenol having about 7–10 carbon atoms in the alkyl group;
2. an alkyl amine having about 12–16 carbon atoms in the alkyl group; and
3. an aliphatic alcohol having about 12–16 carbon atoms;

B. about 0.25–0.30% by weight of an alkyl dimethyl amine oxide in which the alkyl group has about 12–16 carbon atoms;

C. about 0.30–0.40% by weight of a quaternary ammonium halide having the formula



where R_1 and R_2 are methyl; R_3 is methyl or a phenyl-substituted alkyl group having about 8–12 carbon atoms; and R_4 is an alkyl group having about 12–18 carbon atoms;

D. about 5–5.8% by weight of an alkaline inorganic builder selected from the group consisting of the alkali metal carbonates, phosphates, and borates; and

E. a defoaming agent in an amount effective to control foaming of the composition in use; and

F. the remainder water.

4,065,410

POLYURETHANE FOAMS HAVING AN INTEGRAL SKIN USING A MIXTURE OF POLYOLS AS THE CHAIN EXTENDER

Hermann Schäfer, Leverkusen, and Christian Weber, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 22, 1976, Ser. No. 669,071
Claims priority, application Germany, Mar. 27, 1975, 2513817
Int. Cl.[2] C08G *18/28*
U.S. Cl. 260—2.5 AM 10 Claims

1. In a process for the production of polyurethane elastomer moldings having a compact peripheral zone and a cellular core by the in-mold foaming of a foamable reaction mixture which comprises

a. organic polyisocyanate,

b. polyhyroxyl compounds having molecular weights in the range from about 1800 to about 10,000,

c. a chain extender,

d. a blowing agent, and

e. optionally the auxiliaries and additives commonly used in making polyurethanes, the improvement wherein said chain extender (c) is a polyol mixture comprising

i. ethylene glycol,

ii. at least one other polyol having a molecular weight of below 1800,

and wherein said polyol mixture has an average molecular weight below about 600, wherein said component (ii) is used in quantities of from 5 to 30% by weight, based on the sum total of (i) plus (ii), wherein said chain extender (c) is used in quantities of from 10 to 30% by weight, based on component (b), and wherein polyisocyanate (a) is used in such a quantity that the foamable mixture has an isocyanate value of 90 to 120.

4,065,411

PROCESS FOR THE PREPARATION OF EXPANDABLE STYRENE POLYMER PARTICLES

Fumito Yamai, Kusatsu; Tomohiko Ishida, and Yoshinori Ikeda, both of Shiga, all of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Continuation of Ser. No. 582,891, June 2, 1975, abandoned. This application Dec. 1, 1976, Ser. No. 746,251
Claims priority, application Japan, June 3, 1974, 49-63336
Int. Cl.[2] C08J *9/18*
U.S. Cl. 260—2.5 B 6 Claims

1. In the process for the preparation of expandable styrene polymer particles comprising impregnating said particles with an expanding agent in the absence of surface active agents, the improvement which comprises employing in the process calcium hydroxide in an amount from 0.3 to 1.5% by weight of the styrene polymer particles, as the sole suspending agent.

4,065,412

PEPTIDE OR PROTEIN SEQUENCING METHOD AND APPARATUS

William J. Dreyer, Altadena, Calif., assignor to Durrum Instrument Corporation, Sunnyvale, Calif.

Filed May 7, 1976, Ser. No. 684,178
Int. Cl.[2] C08L *37/00*
U.S. Cl. 260—8 29 Claims

1. In a method for the sequential degradation of protein or peptide chains in a reaction chamber by successive coupling and cleavage reactions, the steps of:

a. immobilizing said protein or peptide on a macroporous reaction support surface disposed in the reaction chamber, said immobilization being performed either by nonchemical sorptive deposition onto said support surface or by chemical linkage to said support surface,

b. passing coupling reagent through the reaction chamber to contact said immobilized protein or peptide,

c. directing a pressurized vapor stream comprising coupling base vapor through the reaction chamber while said coupling reagent is in contact with said protein or peptide to provide basic environment for coupling of said coupling reagent to said chains,

d. flowing a liquid washing solvent through the reaction chamber to remove unreacted coupling reagent and other contaminants from the support surface,

e. directing a pressurized stream of inert carrier gas through the reaction chamber after step (d) to at least partially dry said support surface,

f. directing a pressurized vapor stream comprising cleavage reagent vapor through the reaction chamber for sufficient time to cleave amino acid derivatives from said coupled protein or peptide, and

g. flowing a liquid extracting solvent through the reaction chamber after step (f) to extract and withdraw said cleaved amino acid derivative.

4,065,413

FIRE RESISTANCE WOOD-BASED BOARDS, PROCESS FOR PRODUCING SAME AND COMPOSITIONS USEFUL THEREFOR

Martin B. MacInnis, Towanda, and L. Rita Quatrini, Athens, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 8, 1975, Ser. No. 620,918
Int. Cl.[2] C08K *3/32, 5/21*
U.S. Cl. 260—9 8 Claims

1. A process for preparing a fire resistant wall board comprising forming a mixture of wood fibers with about 1% to about 2% by weight of said fibers of a thermosetting resin and about 10% to about 20% by weight of said fibers of a fire retardant composition consisting essentially of an ammonium hydrogen phosphate salt and urea having a P:C atomic ratio of from about 1:1 to about 2:1 and thereafter consolidating said

mixture by the simultaneous application of heat and pressure to form a wood-like panel having a density of greater than 0.5 grams/cc.

4,065,414

POLYION COMPLEX AND POLYION COMPLEX FILM

Toru Seita, and Akihiko Shimizu, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

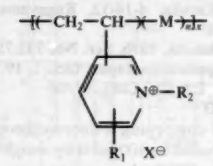
Filed Aug. 6, 1976, Ser. No. 712,397

Claims priority, application Japan, Aug. 13, 1975, 50-97509; Aug. 20, 1975, 50-100227

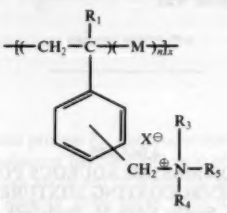
Int. Cl.[2] C08L *1/28;* **C08G** *81/02*

U.S. Cl. 260—17 R **9 Claims**

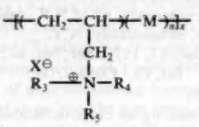
1. A polyion complex produced by reacting a polyanion polymer selected from the group consisting of polystyrenesulfonic acid, polyvinylsulfonic acid, polyacrylic acid, polymethacrylic acid, carboxymethyl cellulose, alginic acid or an alkali salt thereof with a polycation polymer having a terminal ethylenic double bond in the repeating units of the polymer and having repeating units of the formula:



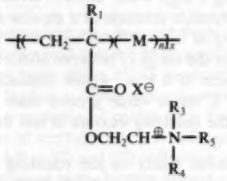
(I)



(II)



(III)



(IV)

wherein R_1 represents hydrogen, or a C_{1-4} alkyl group; R_2 represents a group having the formula:

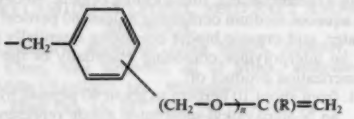
$-CH_2-C(R)=CH_2$,

$-(CH_2)_m COOC(R)=CH_2$,

$-(CH_2)_m COOCH_2-C(R)=CH_2$,

$-(CH_2)_m O-C(R)=CH_2$,

$-(CH_2)_m O-CH_2-C(R)=CH_2$, or



wherein R is hydrogen or a C_{1-4} alkyl group, m is 1 to 3 and n is 0 or 1; R_3, R_4 and R_5 represents a C_{1-4} alkyl group or an alkylol group and at least one of R_3, R_4 and R_5 is the group of R_2 or a group having the formula:

$-(CH_2)_m CONH-C(R)-CH_2$, wherein

R is hydrogen or a C_{1-4} alkyl group and m is 1 or 2; n is 0 or an integer less than 40,000; x is an integer of 10 to 50,000; M represents a vinyl monomer having an ethylenic double bond selected from the group consisting of styrene, α-methylstyrene, acrylonitrile, methacrylonitrile, and butadiene; and X represents a halogen atom or a hydroxyl group.

4,065,415

WATER-BASED COATINGS WITH IMPROVED SAGGING AND POPPING CHARACTERISTICS

Roger M. Christenson, Gibsonia, Pa., and Clarence E. Evjen, Williston, N. Dak., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 1, 1975, Ser. No. 618,582

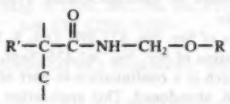
Int. Cl.[2] C08L *33/02*

U.S. Cl. 260—17.4 SG **12 Claims**

1. A water-based coating composition having reduced solvent popping, water-popping and sagging characteristics comprising a thermosetting, film-forming organic binder dispersed in an aqueous medium containing at least 60 percent by weight of water, said organic binder consisting essentially of:

A. an interpolymer consisting essentially of:

1. from about 10 percent to about 40 percent of a carboxylic acid amide in units of the structure:



wherein R′ is hydrogen or lower alkyl and R is lower alkyl;

2. from about 5 to about 20 percent of units of an alpha, beta-ethylenically unsaturated carboxylic acid, and

3. units of at least one other ethylenically unsaturated monomer containing a $CH_2=C<$ group, wherein said interpolymer is solubilized by neutralizing at least part of the carboxylic acid groups with a base;

B. from about 5 percent to about 40 percent by weight of binder solids of a non-volatile water-soluble or water-dispersible polyether polyol or polyester polyol having a molecular weight of at least 300; and

C. from about 5 percent to about 40 percent by weight of binder solids of a water soluble or water-dispersible aldehyde condensation resin.

4,065,416

WATER-BASED COATINGS WITH REDUCED SOLVENT OR WATER POPPING AND SAGGING

Roger M. Christenson, Gibsonia, Pa., and Clarence E. Evjen, Williston, N. Dak., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 1, 1975, Ser. No. 618,584

Int. Cl.[2] C08L *33/02*

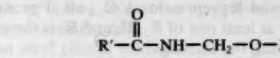
U.S. Cl. 260—17.4 SG **10 Claims**

1. A water-based coating composition having reduced sol-

vent popping, water-popping and sagging characteristics comprising a thermosetting, film-forming organic binder dispersed in an aqueous medium containing at least 60 percent by weight of water, said organic binder consisting essentially of:

A. an interpolymer consisting essentially of the interpolymerization product of:

1. from about 10 percent to about 40 percent by weight of an N-alkoxyalkyl-substituted amide represented by the structure:



wherein R′ is an aliphatic hydrocarbon radical containing from 2 to 6 carbon atoms and having a single terminal polymerizable alpha, beta-ethylenically unsaturated group and R is a lower alkyl radical containing from 1 to 8 carbon atoms,

2. from about 5 to about 20 percent by weight of an alpha, beta-ethylenically unsaturated carboxylic acid, and

3. at least one other ethylenically unsaturated monomer containing a

wherein said interpolymer is solubilized by neutralizing at least a portion of the carboxylic acid groups thereof with a base; and

B. from about 5 percent to about 50 percent by weight of interpolymer solids of a non-volatile water-soluble or water-dispersible polyether polyol or polyester polyol having a molecular weight of at least 300.

4,065,417

REVERSIBLE SHEAR THINNING GEL FORMING COATING COMPOSITION FOR GLASS FIBERS

Robert Wong, Granville, and Homer G. Hill, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 871,098, Oct. 9, 1969, abandoned, which is a division of Ser. No. 762,435, Sept. 25, 1968, Pat. No. 3,533,768, which is a continuation-in-part of Ser. No. 573,870, Aug. 22, 1966, abandoned. This application July 7, 1975, Ser. No. 593,601

Int. Cl.[2] C08L *1/00, 31/04, 63/02, 77/00*

U.S. Cl. 260—17.4 CL **7 Claims**

1. A composition consisting essentially of a polyvinyl acetate resin, an organosilane coupling agent, a gelling agent comprising cellulose, a lubricant comprising a polyethylene glycol and an inorganic liquid solvent for said polyvinyl acetate resin, said composition being a reversible, shear-thinning gel.

4,065,418

HIGH MOLECULAR WEIGHT ESTERS OF α-ALKYL BRANCHED MONOCARBOXYLIC ACIDS

Harold C. Foulks, Jr., Newport, Ky.; Herbert G. Rodenberg, and Harold E. Mains, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 517,332, Oct. 23, 1974, Pat. No. 3,988,330. This application July 9, 1976, Ser. No. 703,756

Int. Cl.[2] C08K *5/10;* **C08H** *3/00;* **C09F** *5/08;* **C11C** *3/02*

U.S. Cl. 260—23 XA **15 Claims**

1. An ester product derived from an aliphatic hydroxylic compound having 2 to 25 carbon atoms and 1 to 10 primary or secondary hydroxyl groups and α-alkyl branched aliphatic monocarboxylic acids having at least 25 carbon atoms obtained by the free radical addition of a short-chain aliphatic monocarboxylic acid having from 3 to 12 carbon atoms and an α-olefin containing 22 to 100 carbon atoms.

9. A thermoplastic composition containing 0.1 to 5 parts per 100 parts resin of an internal-external lubricant ester derived from (a) an aliphatic hydroxylic compound having 2 to 25 carbon atoms and 1 to 10 primary or secondary hydroxyl groups and (b) α-alkyl branched aliphatic monocarboxylic acids having at least 25 carbon atoms obtained by the free radical addition of a short-chain aliphatic monocarboxylic acid having 3 to 6 carbon atoms and an α-olefin containing 22 to 100 carbon atoms.

4,065,419

FLUORO-ELASTOMER COMPOSITION HAVING IMPROVED PROCESSABILITY

Yoshihiko Kawaguchi, 101-C-13, 1 chome, Momoyamadai, Suita, Osaka, Japan (565); Yoshimi Harada, 26, Minami Kibogaoka, Asahi, Yokohama, Kanagawa, Japan (241); Makoto Miki, 1140-162, Imaizumi, Kamakura, Kanagawa, Japan (247); Kanenari Gouda, 1-18-14, Kaminoge, Setagayaku, Tokyo, Japan (158); Masaharu Akiyama, 8-7 Sanocho, Yokosukashi, Kanegawa, Japan (238); Masayuki Tokura, 1193, Isogo, Isogo, Yokohama, Kanagawa, Japan (235), and Jun Kuroha, 4-14-12, Kugayama, Suginamiku, Tokyo, Japan (168)

Filed Oct. 15, 1976, Ser. No. 732,750

Claims priority, application Japan, Oct. 7, 1975, 50-120330

Int. Cl.[2] C08L *91/06*

U.S. Cl. 260—28.5 D **3 Claims**

1. A composition comprising a fluoro-elastomer and 0.1 to 10 parts by weight based on 100 parts by weight of the fluoro-elastomer of rice-bran wax.

4,065,420

METHOD FOR MAKING AQUEOUS POLYIMIDE ELECTROCOATING MIXTURES

John H. Lupinski, Scotia; Edith M. Boldebuck, and Wilson J. Barnes, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,597

Int. Cl.[2] C08J *3/00*

U.S. Cl. 260—29.2 N **7 Claims**

1. A method for making an electrocoatable polyamide acid salt mixture having a high water content which comprises,

1. heating a polyimide solution of a dipolar aprotic organic solvent having at least 15% by weight of polyimide, to a temperature in the range of between about 50° C to 150° C in the presence of a base whose ionization constant in water at 25° C has a value greater than 10^{-2}, until the viscosity of the resulting mixture is less than 4,000 centistokes at 25° C.

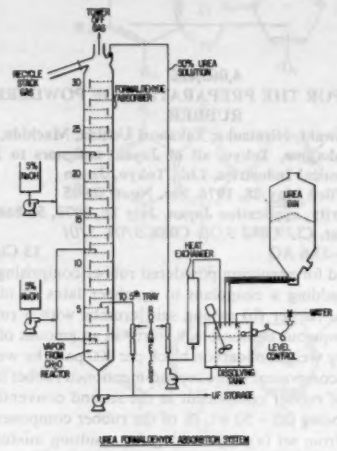
2. adding sufficient water to the resulting mixture of (1) while its viscosity is less than 4,000 centipoises at 25° C, to produce a mixture having from 5% to 40% by weight of dipolar aprotic organic solvent, 40% to 95% by weight of water and 1 to 15% by weight of solids, where the total weight of solids, water and dipolar aprotic solvent is equal to 100%, and the base is utilized in the solution of (1) at a concentration which is sufficient to neutralize any carboxy radicals of the polyimide, while providing from 0.01 to about 1 meq of base/g of polyimide having a MW sufficient to produce a viscosity of at least 1,000 centristokes at 25° C in N-methylpyrrolidone when present at 25% by weight solids.

4,065,421

CONTINUOUS PROCESS FOR THE PRODUCTION OF AQUEOUS UREA-FORMALDEHYDE SOLUTIONS

Charles L. Allyn, Tacoma; James C. Manlove, Federal Way; Gerald M. Chang, Orting, and Robert C. Burmark, Tacoma, all of Wash., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Mar. 17, 1976, Ser. No. 667,702
Int. Cl.[2] C08L 61/24
U.S. Cl. 260—29.4 R 11 Claims



1. A continuous process for the production of aqueous urea-formaldehyde solutions having a mol ratio of formaldehyde to urea ranging from about 4.0 to about 6.0 and having a total solids content ranging from about 65% to about 85% by weight comprising (A) introducing the gases from a formaldehyde converter into the bottom of a single formaldehyde absorber column and (B) allowing said gases to pass upwardly through said column while (C) simultaneously feeding an aqueous solution of urea containing from about 40% to about 80% by weight of urea into the top stage of said column and (D) allowing said aqueous solution of urea to at least partially react with the CH_2O in said gases to form an aqueous solution of low molecular weight urea-formaldehyde addition products while flowing down said column from stage to stage at a temperature ranging from about 25° C to about 80° C while (E) simultaneously feeding a dilute aqueous solution of base into said column at a multiple of points such that the pH of said aqueous solution of methylol-ureas is maintained at a pH ranging from about 6.0 to 9.0 and (F) collecting said aqueous solution of methylol-ureas in the bottom of said column (G) circulating a portion of said aqueous solution of urea-formaldehyde addition products from the bottom of said column back into said column at a point above the last point where the dilute aqueous base is being fed into said column and above the point where said gases are being introduced but below the top stage of said column (H) continuously removing the remainder of said aqueous solution of urea formaldehyde addition products from the bottom of the said column (I) while continuing to feed said aqueous solution of urea into the top stage of said column while (J) continuing to introduce said gases into the bottom of said column.

4,065,422

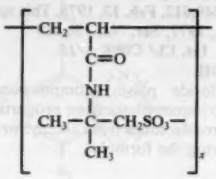
HIGH SLIP POLYMER COMPOSITION CONTAINING A POLYACRYLAMIDO SULFONIC ACID SALT AND AN ALCOHOL

Larry D. Lundmark, Richfield; Allan Melby, Andover, and Ho-ming Chun, New Brighton, all of Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Feb. 16, 1977, Ser. No. 769,353
Int. Cl.[2] C08L 33/02
U.S. Cl. 260—29.6 E 7 Claims

1. A composition of matter which imparts lubricity comprising:

a. from about 0.01% to about 50% by weight of a homopolymeric salt of



wherein x has a value such that the molecular weight of the anionic portion of the polymer is from about 1,000,000 to about 5,000,000, and;

b. from about 1% to about 99.99% by weight of a monohydric alcohol wherein the pH of the composition is from about 3 to about 10.

4,065,423

PAPER COATING LATEX COMPOSITIONS CONTAINING COPOLYMERS OF MONOVINYLIDENE AROMATIC MONOMER, ALIPHATIC CONJUGATED DIENE AND AN ARYLOYLOXYCARBOXYLIC ACID MONOMER

John Hen, Cheshire, Conn., assignor to Uniroyal, Inc., New York, N.Y.

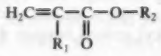
Filed May 3, 1976, Ser. No. 682,811
Int. Cl.[2] C08L 9/00
U.S. Cl. 260—29.7 H 20 Claims

1. A latex of a copolymer of a monomeric mixture containing, by weight:

A. 35 to 75 parts of a monovinylidene aromatic monomer;

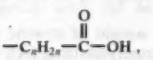
B. correspondingly 65 to 25 parts of an aliphatic conjugated diene, per 100 parts of (A) plus (B), said monomers (A) plus (B) constituting from 75 to 99.5% of the total monomeric mixture;

C. 0.5 to 10% of a monomer having the formula



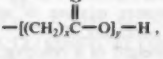
wherein R_1 is hydrogen or an alkyl radical having 1 to 6 carbon atoms and R_2 is:

i.



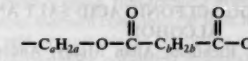
where *n* is 1 to 6;

ii.



where *x* is 1 to 4 and *y* is 2 to 4; or

iii.



where *a* and *b* are the same or different and are from 1 to 4; and

D. optionally 0 to 15% of one or more different hydrophilic monomers, said latex being characterized by improved stability.

4,065,424

LACTONES AND ESTER DERIVATIVES THEREOF

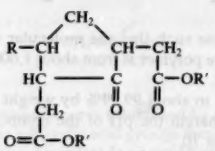
Joe B. Lavigne, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 549,612, Feb. 13, 1975. This application Jan. 11, 1977, Ser. No. 758,389

Int. Cl.[2] C08K *5/12*

U.S. Cl. 260—31.8 DB **1 Claim**

1. Polyvinyl chloride plastic compositions containing amounts sufficient to impart plasticizing properties of the cyclic keto esters of spirodilactones from alkenyl or alkyl bis(succinic anhydride) having the formula



in which R is alkyl or alkenyl of 2 to 28 carbon atoms and R′ groups, which may be the same or different, are hydrogen or alkyl groups of 1 to 8 carbon atoms each.

4,065,425

PROCESS FOR THE PREPARATION OF NON-AQUEOUS DISPERSION COATINGS

George W. Bussell, Dearborn, and Martin W. Kisel, Dearborn Heights, both of Mich., assignors to Inmont Corporation, New York, N.Y.

Continuation of Ser. No. 446,610, Feb. 28, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,092

Int. Cl.[2] C08K *5/01, 5/05, 5/06, 5/10*

U.S. Cl. 260—33.6 EP **10 Claims**

1. The method of preparing a storage stable, pigmented, non-aqueous dispersed polymer coating composition comprising:

a. preparing a volatile organic solvent solution containing 40 to 60% by weight of a stabilizer copolymer consisting essentially of

A. 40 to 70% of at least one solubilizing monomer of the group consisting of alkyl and cycloalkyl esters of acrylic and methacrylic acids and alcohols wherein the alkyl or cycloalkyl groups contain 4 or more carbon atoms,

B. 15 to 20% by weight of a reactive group containing monomer of the group consisting of hydroxyethyl, hydroxypropyl and glycidyl esters of acrylic and methacrylic acids,

C. 0.5 to 1.5% by weight of an α, β-unsaturated carboxylic acid and

D. 15 to 20% by weight of styrene or a derivative of styrene and by copolymerizing (A), (B), (C) and (D) in a volatile solvent comprised predominantly of aliphatic hydrocarbons having a boiling point in the range of 130° to 140° C.

b. forming a composition comprising a dispersion of copolymer in the solution of stabilizer copolymer of (a) by copolymerizing a monomer mixture in said solution, said monomer mixture consisting of

1. 10 to 30% by weight of a reactive group containing monomer of the group consisting of hydroxyethyl, hydroxypropyl and glycidyl esters of acrylic and methacrylic acids,

2. 0 to 3% by weight of an α, β-unsaturated carboxylic acid,

3. 30 to 80% by weight of a lower alkyl ester of acrylic or methacrylic acid and

4. 0 to 50% by weight of styrene or a derivative of styrene,

and the total solids in said composition consists of 50–90% by weight of dispersed copolymer and 10 to 50% by weight of dissolved polymer and

c. mixing the dispersion obtained in (b) with pigment and aminoplast resin to obtain paint composition containing 30 to 50 % solids with a resin to pigment ratio of from about 50 to 1 to about 3.5 to 1.

4,065,426

METHOD FOR THE PREPARATION OF POWDERED RUBBER

Takeshi Yamawaki, Hiratsuka; Takanori Uchida, Machida, and Makoto Nakajima, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed May 28, 1976, Ser. No. 690,905

Claims priority, application Japan, July 16, 1975, 50-86827

Int. Cl.[2] C08J *3/20;* **C08K** *3/04, 5/01*

U.S. Cl. 260—33.6 AQ **13 Claims**

1. A method for preparing powdered rubber comprising the steps of: (a) adding a coagulant to a rubber latex to obtain crumbs of the rubber (b) mixing said crumbs with a rubber latex and an aqueous carbon black slurry in an amount of 100 – 1000 parts by weight of carbon black per 100 parts by weight of the rubber component in the second-mentioned rubber latex; said weight of rubber component in the second conventional rubber latex being 0.5 – 50 wt. % of the rubber component of said crumbs from set (a), (c) treating the resulting mixture in the presence of a coagulant; and (d) separating the thus treated crumbs from the serum and drying the separated crumbs.

4,065,427

POLYCHROMOPHORIC HETEROCYCLIC ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

David M. Pond; Richard H. S. Wang, and Gether Irick, Jr., all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

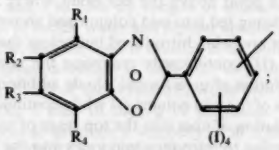
Division of Ser. No. 523,628, Nov. 14, 1974, Pat. No. 4,000,148. This application Oct. 7, 1976, Ser. No. 730,120

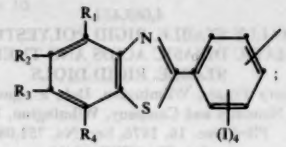
Int. Cl.[2] C08K *5/35*

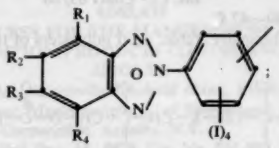
U.S. Cl. 260—45.8 NT **20 Claims**

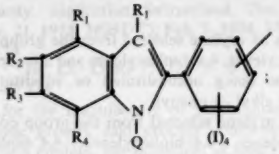
1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one aromatic ester compound having the formula:

wherein A is a group having the structure:









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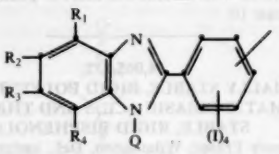
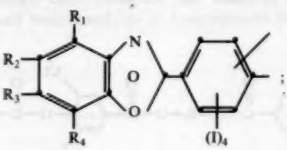
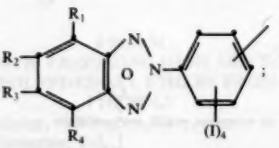
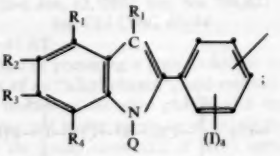
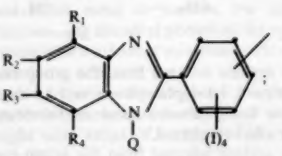


and B is a group having the structure:









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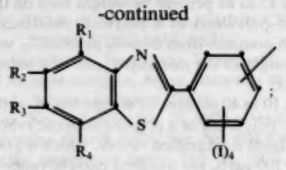

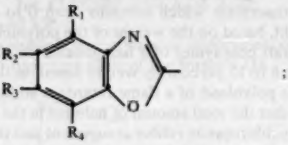

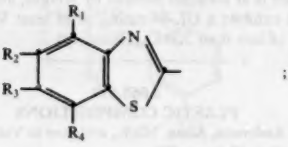

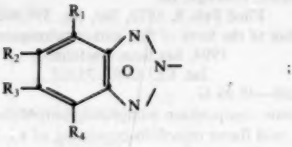

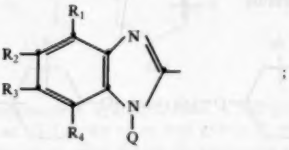

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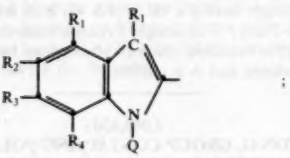


wherein

Q is a hydrogen atom or an alkyl group having 1 to 12 carbon atoms;

R_1, R_2, R_3 and R_4 are hydrogen, lower alkyl, phenyl, chlorine, bromine, lower alkyl phenyl, lower alkyloxy, carboxy, nitrile;

I is the same as R_1, R_2, R_3 and R_4, and is present on all positions of the benzenoid ring, except the carbon atom attached to the Y substituent and the carbon atoms attached to the carboxyl group connecting the heterocyclic aromatic A group with the heterocyclic aromatic B group.

4,065,428

POLYMETHYLMETHACRYLATE BASED MOLDING COMPOSITIONS

Gary L. Deets, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 5, 1975, Ser. No. 637,926

Int. Cl.[2] C08K *3/20;* **C08L** *51/04*

U.S. Cl. 260—45.75 B **11 Claims**

1. A polyblend molding composition comprising:

A. from 45 to 84 percent by weight bsed on the total weight of the polyblend of a polymethylmethacrylate polymer which contains from 0 to 40 percent by weight based on the weight of the matrix polymer of a halogenated comonomer;

B. from 10 to 40 percent by weight based on the total weight of the polyblend of a polychloroprene rubber component, calculated as ungrafted rubber, which is grafted with from 10 to 100 parts, per hundred parts of rubber, of polymethylmethacrylate which contains from 0 to 40 percent by weight, based on the weight of the polymethylmethacrylate graft copolymer of a halogenated comonomer; and

C. from 6 to 15 percent by weight based on the total weight of the polyblend of a flame retardant additive;

provided that the total amount of halogen in the polyblend due to the polychloroprene rubber component and the halogenated comonomer is at least 9.0 percent by weight; and wherein the polyblend exhibits a UL-94 rating of at least V-1 and smoke evolution of less than 300 D_m (Flaming).

4,065,429

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

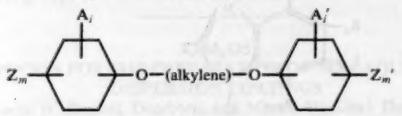
Filed Feb. 8, 1973, Ser. No. 330,805

The portion of the term of this patent subsequent to Aug. 30, 1994, has been disclaimed.

Int. Cl.[2] C08L *23/02*

U.S. Cl. 260—45.95 G **14 Claims**

1. A plastic composition comprising polyolefins and a flame retardant, said flame retardant consisting of a compound having the formula



(I)

wherein Z is bromine; m is an integer having a value of 1–5 and m' is an integer having a value of 0–4; i is an integer having a value of 0–2 and i' is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

4,065,430

FUNCTIONAL GROUP CONTAINING POLYMER AND METHOD OF PREPARING THE SAME

Masato Satomura, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

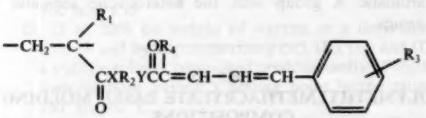
Division of Ser. No. 441,782, Feb. 12, 1974, Pat. No. 3,933,885. This application Oct. 9, 1975, Ser. No. 621,103

Claims priority, application Japan, Feb. 13, 1973, 48-177163

Int. Cl.[2] C08F *118/00*

U.S. Cl. 260—47 UA **9 Claims**

1. A functional group containing polymer containing 1 to 90 mol percent of the monomer unit represented by the general formula (I)



(I)

wherein R_1 represents a hydrogen atom or a methyl group; R_2 represents a divalent group having a total of 2 to 10 carbon atoms; R_3 is a hydrogen atom, a halogen atom, a methoxy group, a nitro group or a methyl group; R_4 is a hydrogen atom, a cyano group or a carbamoyl group; X and Y each represents —0—; and R_5 represents a hydrogen atom, a methyl group or an ethyl group.

4,065,431

THERMALLY STABLE, RIGID POLYESTERS FROM AROMATIC DIBASIC ACIDS AND THERMALLY STABLE, RIGID DIOLS

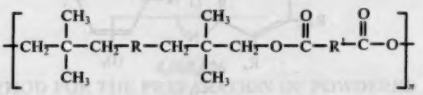
August Henry Frazer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1976, Ser. No. 751,087

Int. Cl.[2] C08G *63/66*

U.S. Cl. 260—47 C **9 Claims**

1. The thermally stable, rigid polyesters of the formula



where R is an arylene selected from the group consisting of 1,4-phenylenes, 4,4′-biphenylenes and 2,6-naphthylenes, said arylene being unsubstituted or substituted with halo, lower alkyl or phenyl,

R^1 is an arylene selected from the group consisting of 1,4-phenylenes, 4,4′-biphenylenes, 4,4′-biphenyleneoxides, and 2,6-naphthylenes, said arylene being unsubstituted or substituted with halo, lower alkyl or phenyl; and

n is at least 10.

4,065,432

THERMALLY STABLE, RIGID POLYESTERS FROM AROMATIC DIBASIC ACIDS AND THERMALLY STABLE, RIGID BISPHENOLS

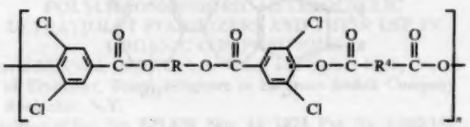
August Henry Frazer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1976, Ser. No. 751,088

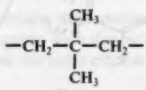
Int. Cl.[2] C08G *63/18, 63/68*

U.S. Cl. 260—47 C **9 Claims**

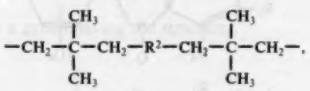
1. The thermally stable, rigid, ordered polyesters of the formula



where R is



or



where

R^2 is an arylene selected from the group consisting of 1,4-phenylenes, 4,4′-biphenylenes, and 2,6-naphthylenes, said arylene being unsubstituted or substituted with halo, lower alkyl or phenyl,

R^4 is an arylene selected from the group consisting of 1,4-

phenylenes, 4,4'-biphenylenes, 4,4'-biphenylene oxides, and 2,6-naphthylenes, said arylene being unsubstituted or substituted with halo, lower alkyl or phenyl, and
n is at least 10.

4,065,433

PROCESS FOR THE MANUFACTURE OF POLYADDITION PRODUCTS CONTAINING IMIDE GROUPS

Albrecht Muller, Allschwil; Theobald Haug, Frankendorf, and Alfred Renner, Munchenstein, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

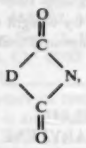
Filed Dec. 18, 1974, Ser. No. 534,104

Claims priority, application Switzerland, Dec. 21, 1973, 18051/73; Dec. 21, 1973, 18052/73; Feb. 7, 1974, 1769/74; Feb. 7, 1974, 1770/74

Int. Cl.[2] C08G *73/12, 73/16*

U.S. Cl. 260—47 UA **61 Claims**

1. Process for the manufacture of polyaddition products containing imide groups, said process comprising reacting polyimides which contain, per molecule, at least two radicals of the general formula



(I)

in which D denotes a divalent radical containing a carbon-carbon double bond, with polyhydric alcohols in the presence of basic compounds selected from the group consisting of primary polyamines, basic catalysts, and mixtures of primary polyamines and basic catalysts at temperatures between 50° and 280° C.

4,065,434

METHOD OF PREPARING HIGH MOLECULAR WEIGHT POLYPHENOXY ETHERS FROM ALKYL PHENOLS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Jan. 12, 1977, Ser. No. 758,827

Int. Cl.[2] C08G *65/44*

U.S. Cl. 260—47 ET **17 Claims**

1. In a method of preparing a high molecular weight polyphenoxy ether of an "alkyl phenol", said method comprising contacting a solution of the alkyl phenol with oxygen or an oxygen carrying gas in the presence of an alkaline material selected from the group consisting of alkali metal alkoxides hydroxides and alkali metal carbonates, the improvement which comprises reacting the alkyl phenol in the presence of a catalyst containing mixed oxides of manganese, chromium, and copper supported on activated or precipitated alumina in which the metals are present by weight of the catalyst from about 5 to 25 percent chromium, 3 to 15 percent copper and in which the weight ratio range of manganese to chromium is 1.9–0.9 to 1.

4,065,435

WATER-SOLUBLE POLYMERS AND PROCESS FOR PRODUCING THE SAME

Shinji Sakaguchi; Shinichi Imai; Junn Yamaguchi, and Nobuo Tsuji, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

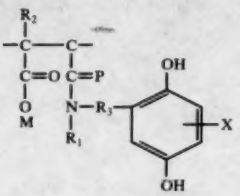
Division of Ser. No. 535,657, Dec. 23, 1974, abandoned. This application June 9, 1976, Ser. No. 694,424

Claims priority, application Japan, Dec. 21, 1973, 48-3111

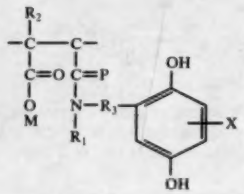
Int. Cl.[2] C08F *8/00, 8/28, 8/30*

U.S. Cl. 260—47 UP **10 Claims**

1. A water soluble homopolymer or copolymer containing in its main chain recurring units of the formula (I):

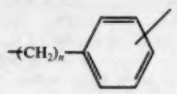


or the formula (II):



(II)

wherein X represents a hydrogen atom, a halogen atom, an alkyl group, an allyl group or an aryl group; R_1 represents a hydrogen atom or an alkyl group; R_2 represents a hydrogen atom, an alkyl group or an aryl group; R_3 represents a divalent group selected from the group consisting of a straight chain alkylene group having 1 to 8 carbon atoms; a branched chain alkylene group having 1 to 8 carbon atoms; an arylene group and a group having the formula:



wherein *n* is an integer of 1 to 4; and M is selected from the group consisting of a hydrogen atom, an alkali metal atom and a quaternary ammonium group.

4,065,436

THERMOPLASTIC POLYCARBONATE MOULDING COMPOSITIONS WITH IMPROVED EASE OF MOULD RELEASE

Siegfried Adelmann; Dieter Margotte; Hugo Vernaleken, and Werner Nouvertne, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 30, 1976, Ser. No. 710,069

Claims priority, application Germany, May 7, 1976, 2620257

Int. Cl.[2] C08L *69/00*

U.S. Cl. 260—47 XA **7 Claims**

1. A thermoplastic moulding composition comprising a thermoplastic aromatic polycarbonate based on an aromatic dihydroxy compound having a mean weight-average molecular weight, M_w, of at least 10,000 and containing 0.01 to 0.5%

by weight of an ester of a saturated aliphatic carboxylic acid with 10 to 20 C atoms per molecule and an aromatic hydroxy compound with 1 to 6 hydroxyl groups.

4,065,437

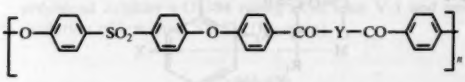
AROMATIC POLYETHER-SULFONES

Gerd Blinne, Freinsheim, and Claus Cordes, Weisenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 12, 1976, Ser. No. 731,127
Claims priority, application Germany, Nov. 5, 1975, 2549529
Int. Cl.[2] C08G *2/18, 8/02, 63/66, 65/40*
U.S. Cl. 260—49 **7 Claims**

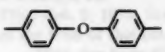
1. An aromatic polyethersulfone having repeating units of the formula (Ia)

(Ia),



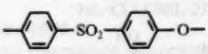
where Y is selected from the group consisting of

(II)



and

(III),



individual Y's being identical or different, *n* is an integer of from 20 to 250, and the terminal groups being selected from the group consisting of hydroxy, alkoxy of 1 to 5 carbon atoms, F and Cl.

4,065,438

PROCESS FOR PRODUCTION ACID POLYESTER RESINS AND POWDER COATING PRODUCTS PREPARED FROM SAID RESINS

Jozef Verborgt, Brussels, Belgium, assirnor to Labofina S. A., Brussels, Belgium

Filed Feb. 1, 1977, Ser. No. 764,902
Claims priority, application Belgium, Feb. 2, 1976, 163996
Int. Cl.[2] C08G *63/12*
U.S. Cl. 260—75 R **5 Claims**

1. Process for producing acid polyester resins which are used to manufacture coating products by reaction with an epoxy resin, said polyester acid resins being produced from a prepolymer having a hydroxyl index comprised between 40 and 200, said prepolymer being prepared from at least one divalent aliphatic alcohol and a mixture of organic acids, this process being characterized by the fact that said mixture of organic acids comprises from 10 to 100% by weight of terephthalic acid, from 0 to 90% by weight of isophthalic acid and from 0 to 20% by weight of trimellitic acid or its anhydride, and that the acid polyester resin is prepared by reacting said prepolymer with isophthalic acid, said acid polyester resin having an acid index comprised between 50 and 100.

4,065,439

COPOLYESTER AND PROCESS FOR THE PRODUCTION THEREOF

Keiichi Uno, and Takahito Miyagawa, both of Otsu, Japan, assignors to Toyobo Co., Ltd., Otsu, Japan

Filed June 10, 1975, Ser. No. 585,753
Int. Cl.[2] C08G *63/18*
U.S. Cl. 260—75 R **6 Claims**

1. A copolyester derived from:

a. terephthalic acid or an ester-forming derivative thereof,

b. isophthalic acid or an ester-forming derivative thereof,

c. an aliphatic dicarboxylic acid of the formula:

$$HOOC-(CH_2)_n-COOH$$

wherein *n* is an integer of 4 to 7, inclusive, or an ester-forming derivative thereof,

d. ethylene glycol, and

e. neopentyl glycol,

wherein the molar ratios of the components in the copolyester are as follows:

$$50/50 \leqq [(a)+(b)]/(c) \leqq 75/25$$

$$30/70 \leqq (a)/(b) \leqq 70/30$$

$$40/60 \leqq (d)/(e) \leqq 80/20.$$

4,065,440

MALONATE ESTER CHAIN COUPLING OF POLYESTERS

Carl Serres, Jr., Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 9, 1976, Ser. No. 712,541
Int. Cl.[2] C08G *63/18, 63/46*
U.S. Cl. 260—75 R **10 Claims**

1. The method of increasing the molecular weight of polyesters which comprises forming a composition comprising a polyester having an I.V. of at least 0.2 dl/g and 0.1 to 10 parts by weight of a compound having two or three alkylidene malonate groups per 100 parts by weight of said polyester and reacting said polyester and compound under melt or solid state polymerization conditions.

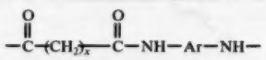
4,065,441

COPOLYAMIDE FROM ARYLENE DIAMINE AND MIXTURE OF ALKYLENE DICARBOXYLIC ACIDS

Philip S. Andrews, Hamden; William J. Farrissey, Jr., Northford; Besir K. Onder, North Haven, and James N. Tilley, Cheshire, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 8, 1976, Ser. No. 664,763
Int. Cl.[2] C08G *69/20*
U.S. Cl. 260—78 R **7 Claims**

1. A fiber forming injection moldable copolyamide consisting essentially of the recurring unit.



wherein *x* in 50 percent to 85 percent of the recurring units represents an integer from 6 to 10, inclusive, and in 15 percent to 50 percent of the recurring units *x* is 4, and Ar is 4,4'-methylenediphenylene.

4,065,442

PYROLYSIS COMPOSITIONS FROM SILVER SALTS OF POLYCARBOXYLIC ACIDS

Ellis K. Fields, River Forest; Wilford J. Zimmerschied, and David A. Palmer, both of Naperville, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Oct. 31, 1974, Ser. No. 519,640
Int. Cl.[2] B01J *23/50*
U.S. Cl. 260—78.41 **17 Claims**

1. A process for producing high surface area compositions with predetermined structure which comprises pyrolyzing at a decomposition temperature within the range of from about 200° to 500° C polysilver salts of polycarboxylic acids containing two to eight carboxyl groups comprising at least one member selected from the group consisting of aromatic polycarboxylic acids and heterocyclic polycarboxylic acids.

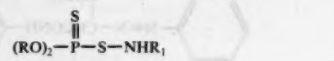
4,065,443

VULCANIZATION OF RUBBER WITH PHOSPHINOTHIOYL AMINO SULFIDES

Robert H. Campbell, and Raleigh W. Wise, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed July 15, 1976, Ser. No. 705,672
Int. Cl.[2] C08F *28/00*
U.S. Cl. 260—79.5 B 18 Claims

1. A process for vulcanizing rubber which comprises heating a sulfur-vulcanizable diene rubber composition containing sulfur-vulcanizing agent and an accelerating amount of a compound of the formula



in which R and R_1 independently are alkyl of 1 to 12 carbon atoms, cycloalkyl of 5–8 carbon atoms, alkaryl of 7 to 10 carbon atoms, phenyl or mono- or di-lower alkyl substituted phenyl.

4,065,444

GRAFT COPOLYMER ON BUTADIENE-PIPERYLENE ELASTOMER

Edward A. Delaney, Woodbury, Conn.; Norman J. Pinkowski, St. Louis, Mo., and Walter Nudenberg, Newtown, Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 454,992, March 25, 1974, abandoned. This application Sept. 2, 1975, Ser. No. 609,458
Int. Cl.[2] C08F *279/04, 36/06*
U.S. Cl. 260—880 R 2 Claims

1. A graft copolymer of resin-forming monomeric material onto a spine which is an elastomeric copolymer of butadiene-1,3 and piperylene, the butadiene-1,3being found in at least 70% cis-1,4-addition and less than 10% vinyl-1,2-addition, said spine copolymer containing from about 5 to about 80 weight percent of piperylene and from about 95 to about 20 weight percent of butadiene, the piperylene units being incorporated in the approximate ratio of

$$1,4/1,2 = 2$$

the ratio of resin-forming monomeric material to spine copolymer being within the range of from 60:40 to 80:20 by weight, and the said resin-forming monomeric material being a mixture of styrene and acrylonitrile.

4,065,445

PREGNANCY-SPECIFIC β_1-GLYCOPROTEIN AND PROCESS FOR ISOLATING IT

Hans Bohn, Marburg, Marbach, and Ferdinand Stutzinger, Waldstetten, both of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Lahn, Germany

Continuation-in-part of Ser. No. 292,735, Sept. 27, 1972, abandoned. This application Apr. 18, 1975, Ser. No. 569,476
Claims priority, application Germany, Sept. 29, 1971, 2148587; Nov. 20, 1971, 2157610
Int. Cl.[2] A23J *1/06*
U.S. Cl. 260—112 B 12 Claims

1. A purified, isolated pregnancy-specific β_1-glycoprotein characterized by an electrophoretic migration speed in agar gel in the range of the β_1-globulins,

a sedimentation constant of 4.6 ± 0.5 S,

a molecular weight of 100,000 ± 15,000,

an extinction coefficient $E_{1cm}^{1\%}$ of 11.6 ± 0.5 (278 mμ; 1/15-molar phosphate buffer, pH 7.0),

a carbohydrate content of 28.05 ± 1.55%, comprising 10.7 ± 1.0% of hexoses, 10.0 ± 0.5% of hexosamine, 0.55 ± 0.05% of focose and 7.0 ± 0.5% of neuraminic acid.

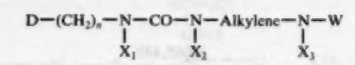
4,065,446

REACTIVE DYESTUFFS CONTAINING UREA ALKYLENE LINKAGE BETWEEN CHROMOPHORE AND REACTIVE RADICAL

Hans-Samuel Bien, Burscheid, and Wolfgang Harms, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 24, 1972, Ser. No. 237,920
Claims priority, application Germany, Mar. 24, 1971, 2114158
Int. Cl.[2] C09B *62/20, 62/22, 62/24, 62/26*
U.S. Cl. 260—146 D 14 Claims

1. Reactive dyetuff of the formula



in which

W is a heterocyclic or aliphatic fiber reactive radical capable of reacting with an amino, amido or hydroxyl group on a fiber; which is bound to

by a carbon atom on W;

D is a radical of an aromatic ring containing organic dyestuff which is bound to $—(CH_2)_n—$ by an aromatic carbon on D; X_1 is hydrogen; C_1–C_4-alkyl; or C_1–C_4-alkyl substituted by hydroxyl, sulfo or sulfato;

X_2 and X_3 are hydrogen; C_1–C_4-alkyl; C_1–C_4-alkyl substituted by hydroxyl, sulfo or sulfato; cyclohexyl; phenyl; benzyl; phenethyl; or cyclohexyl, phenyl, benzyl or phenethyl substituted by hydroxyl, sulfo, carboxy, sulfamoyl or carbamoyl; or X_2 and X_3 together are $—CH_2—CH_2—$;

Alkylene is C_1–C_6-alkylene, $—CH_2—CH—(OH)—CH_2—$ or cyclohexylene; and *n* is 0 or 1.

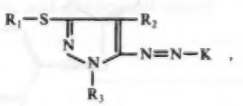
4,065,447

AZO COMPOUNDS HAVING A 3-ARYLTHIO- OR ALIPHATICTHIO-4-CYANO- OR ALKOXYCARBONYL-PYRAZOLYL-5 DIAZO COMPONENT RADICAL

Armand Jotterand, Lancy, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Sept. 15, 1975, Ser. No. 613,391
Claims priority, application Switzerland, Sept. 17, 1974, 12629/74
Int. Cl.[2] C09B *29/06, 29/08, 29/36, 29/38*
U.S. Cl. 260—163 14 Claims

1. A monoazo dye of the formula



wherein

each of R_1 and R_3 is independently C_{2-4}alkenyl; C_{1-4}alkyl; C_{1-4}alkyl monosubstituted by hydroxy, cyano, C_{1-4}alkoxy, phenyl, phenoxy, chloro or bromo; phenyl or substituted phenyl having 1 to 3 substituents each of which is independently chloro, bromo, methyl, methoxy, ethoxy, cyano, nitro, methoxycarbonyl, ethoxycarbonyl, sulfamoyl, C_{1-4}-alkylsulfamoyl or di-(C_{1-4}alkyl)sulfamoyl, with the proviso that the maximum number of substituents selected from the group consisting of methoxy, ethoxy, cyano and nitro is two and the maximum number of substituents selected from the group consisting of methoxycarbonyl,

ethoxycarbonyl, sulfamoyl, C_{1-4}alkylsulfamoyl and di-(C_{1-4}alkyl)sulfamoyl is one,

R_2 is cyano or (C_{1-4}alkoxy)carbonyl, and

K is a coupling component radical of the N-alkyl-aminobenzene, N,N-dialkylaminobenzene, α-N-alkyl-aminonaphthalene, α-N,N-dialkylaminonaphthalene, pyrazolone, 5-aminopyrazole or 3-cyano-4-alkyl-6-hydroxypyridone-2 series.

4,065,448

TERTIARY ALKYL SUBSTITUTED DISAZO PIGMENTS

Willy Muller, Riehen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

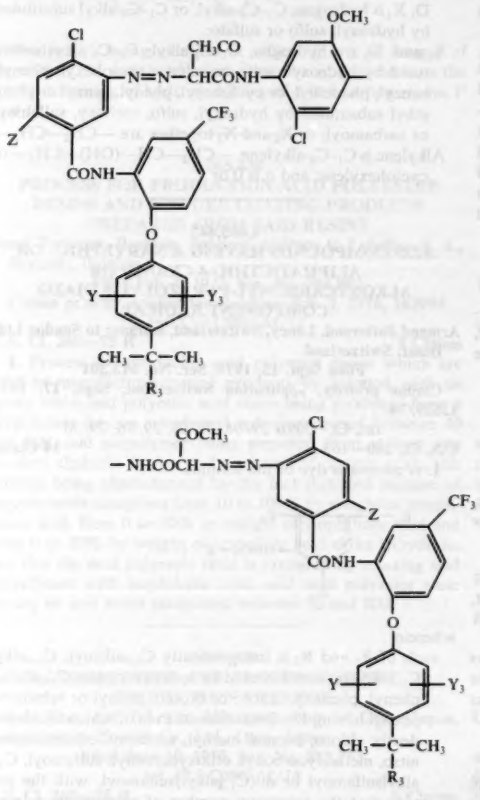
Continuation-in-part of Ser. No. 526,021, Nov. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 365,664, May 31, 1973, abandoned, which is a continuation of Ser. No. 109,955, Jan. 26, 1971, abandoned. This application Dec. 10, 1975, Ser. No. 639,561

Claims priority, application Switzerland, Feb. 3, 1970, 1522/70

Int. Cl.² C09B *43/12*

U.S. Cl. 260—176 **4 Claims**

1. A disazo pigment of the formula



wherein R_3 is alkyl containing 2 to 6 carbon atoms, Y is hydrogen, chloro, or lower alkyl, Y_3 is hydrogen, or lower alkyl, and Z is hydrogen or chloro.

4,065,449

TETRACHLORO SUBSTITUTED DISAZO PIGMENTS

Georg Cseh, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

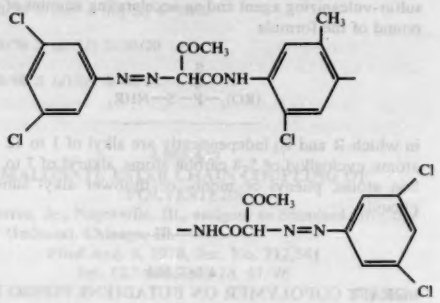
Filed Dec. 10, 1975, Ser. No. 639,560

Claims priority, application Switzerland, Dec. 17, 1974, 16812/74

Int. Cl.² C09B *33/14*

U.S. Cl. 260—176 **1 Claim**

1. A disazo pigment of the formula



4,065,450

PROCESS FOR PREPARING 2-GUANIDINOMETHYL-PERHYDROAZOCINE-SULFATE

Jozsef Rakoczi; Ivan Beck; Csaba Kiss; Imre Horvath, and Miklos Nemes, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

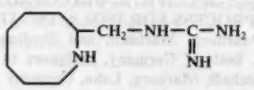
Filed Feb. 26, 1976, Ser. No. 661,613

Claims priority, application Hungary, Feb. 27, 1975, EE 2313

Int. Cl.² C07D *223/04*

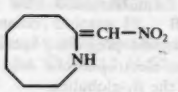
U.S. Cl. 260—239 B **3 Claims**

1. A novel process for preparing 2-guanidinomethyl-perhydroazocine-sulfate of formula I



I

by catalytical reduction of 2-nitromethylene-perhydroazocine of formula IV



IV

and reacting the thus-obtained product with S-methyl-isothiocarbamide-sulfate, characterized in that the 2-nitromethylene-perhydroazocine is hydrogenated in solution in acetone at a temperature of 20 to 50° C, whereafter the separated reaction product is treated with an aqueous mineral acid and then reacted with the S-methyl-isothiocarbamid-sulfate.

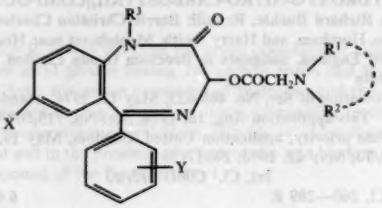
4,065,451

1,3-DIHYDRO-3-HYDROXY-5-PHENYL-2H-1,4-BENZODIAZEPIN-2-ONE, SUBSTITUTED DIAMINO ACETATE ESTERS AND THEIR ACID SALTS

Ronald J. McCaully, Malvern; Abraham Nudelman, Bala Cynwyd, and Stanley C. Bell, Penn Valley, all of Pa., assignors to American Home Products, New York, N.Y.

Continuation-in-part of Ser. No. 129,638, March 30, 1971, abandoned. This application Feb. 4, 1972, Ser. No. 223,712
Int. Cl.[2] C07D *243/24, 403/12*
U.S. Cl. 260—239.3 D 12 Claims

1. A compound selected from the group consisting of

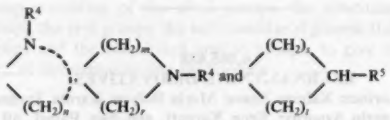


wherein

R^1 is a member selected from the group consisting of alkyl of 1 to 6 carbon atoms and hydrocarbyl aralkyl of 7 to 16 carbon atoms;

R^2 is a member selected from the group consisting of dialkylaminoalkyl of 3 to 18 carbon atoms, and hydrocarbyl diaralkylaminoalkyl of 14 to 32 carbon atoms;

R^1 and R^2, when taken together form a member selected from the group consisting of



wherein R^4 is a member selected from the group consisting of alkyl of 1 to 6 carbon atoms, hydrocarbyl aryl of 6 to 10 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms, hydrocarbyl aralkyl of 7 to 16 carbon atoms and alkoxyalkyl of 2 to 12 carbon atoms;

R^5 is a member selected from the group consisting of alkylamino of 1 to 6 carbon atoms and piperidino; *n* is one of the integers 3, 4 or 5; *m* is one of the integers 1 or 2; *r* is one of the integers 2 or 3; *s* is an integer from 0 to 6; *t* is an integer from 0 to 6; with the proviso that the sum of s and t must be at least 3 and not more than 6;

R^3 is a member selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, hydrocarbyl aralkyl of 7 to 12 carbon atoms and alkoxy alkyl of 2 to 12 carbon atoms;

X is a member selected from the group consisting of halogen, cyano, trifluoromethyl, nitro and alkylthio of 1 to 6 carbon atoms;

Y is a member selected from the group consisting of hydrogen, halogen, trifluoromethyl, nitro and alkylthio of 1 to 6 carbon atoms; and the pharmaceutically acceptable salts thereof.

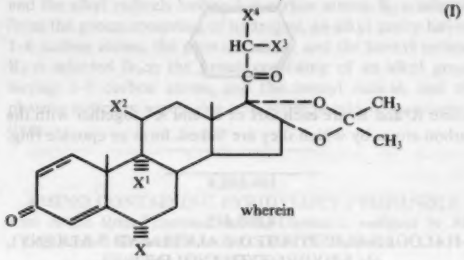
4,065,452

21,21-DIHALO STEROIDS

Tsung-tee Li, Palo Alto; Michael Marx, Sunnyvale, and Lewis J. Throop, Los Altos, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Aug. 2, 1976, Ser. No. 711,042
Int. Cl.[2] C07J *71/00;* A61K *31/58*
U.S. Cl. 260—239.55 D 29 Claims

1. A compound chosen from those represented by the formula



(I)

wherein

X is hydrogen, fluoro, or chloro;

X^1 is hydrogen, fluoro, chloro or bromo;

X^2 is hydroxy or may be chloro when X^1 is chloro;

X^3 and X^4 are independently fluoro, chloro or bromo; and the broken line between C-1 and C-2 indicates that the bond between C-1 and C-2 is a single or a double bond.

4,065,453

LEVOROTATORY MOLINDONE AND THE USE AS AN ANTIDEPRESSANT

Michael Finizio, Howard Beach, N.Y., assignor to Endo Laboratories, Inc., Garden City, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,658
Int. Cl.[2] A61K *27/00;* C07D *295/00*
U.S. Cl. 424—248.56 3 Claims

1. The levorotatory enantiomer of 3-ethyl-6,7-dihydro-2-methyl-5(morpholinomethyl)indol-4 (5H)-one or a pharmaceutically acceptable acid addition salt thereof in the absence of any substantial amount of the dextrorotatory enantiomer.

3. A method of producing an antidepressant effect in warm-blooded animals comprising administering to said warm-blooded animals an effective antidepressant amount of the levorotatory enantiomer of claim 1 or a pharmaceutically acceptable acid addition salt thereof.

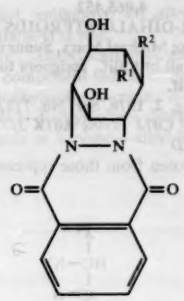
4,065,454

1,3-DIDESOXY-1,3-[N,N'-(1',2',3',4'-TETRAHYDRO-1',4'-DIOXO)-PHTHALAZINO]-INOSITOL COMPOUNDS

Horst Koenig, Ludwigshafen; Horst Prinzbach, and Reinhard Schwesinger, both of Freiburg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed July 26, 1976, Ser. No. 708,604
Claims priority, application Germany, Aug. 11, 1975, 2535754
Int. Cl.[2] C07D *237/30*
U.S. Cl. 260—250 P 4 Claims

1. A compound of the formula 1



where R^1 and R^2 are each OH or R^1 and R^2, together with the carbon atoms by which they are linked, form an epoxide ring.

4,065,455

5-HALOGEN-SUBSTITUTED 7 ALKYL AND 7-ALKENYL 8-HYDROXYQUINOLINES

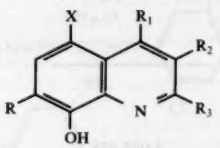
Phillip L. Mattison, New Brighton, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Mar. 4, 1974, Ser. No. 447,629

Int. Cl.[2] C07D *215/24*

U.S. Cl. 260—289 XA **14 Claims**

1. A compound of the formula:



wherein X is Cl or Br, R is a branched chain alkenyl radical of about 8 to 20 carbon atoms obtained by reaction of a starting 8-hydroxyquinoline compound with a 1-chloro-1-alkene and R_1, R_2 and R_3 are hydrogen or alkyl groups of 1 to 4 carbon atoms with the proviso that at least two of R_1, R_2 and R_3 are hydrogen.

4,065,456

GLYCEROL DERIVATIVES OF QUINOLINE CARBOSTYRYL AND ISOCARBO STYRYL

Kazuyuki Nakagawa; Nanami Murakami; Hideo Mori, and Kaoru Tanimura, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

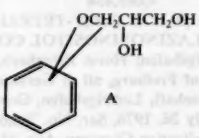
Filed Oct. 24, 1974, Ser. No. 517,730

Claims priority, application Japan, Oct. 24, 1973, 48-120237; Oct. 26, 1973, 48-120994; Aug. 7, 1974, 49-90985; Aug. 7, 1974, 49-90986

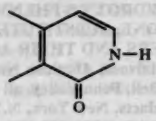
Int. Cl.[2] C07D *215/22, 217/24*

U.S. Cl. 260—289 R **28 Claims**

1. A glycerol derivative represented by the formula



wherein A represents the atoms necessary to complete a bicyclic ring selected from the group consisting of



wherein R represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms or a phenylalkyl group having 1 or 2 carbon atoms in the alkyl moiety thereof; and the optically active isomers thereof.

4,065,457

4-HYDROXY-3-NITRO-CARBOSTYRIL COMPOUNDS

Derek Richard Buckle, Redhill; Barrie Christian Charles Cantello, Horsham, and Harry Smith, Maplehurst near Horsham, all of England, assignors to Beecham Group Limited, Great Britain

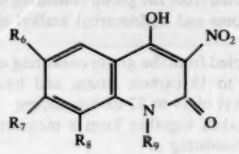
Continuation of Ser. No. 469,623, May 13, 1974, abandoned. This application Aug. 18, 1976, Ser. No. 715,501

Claims priority, application United Kingdom, May 19, 1973, 24000/73; May 22, 1973, 24317/73

Int. Cl.[2] C00D *215/22*

U.S. Cl. 260—289 K **6 Claims**

1. A compound of the formula (IA) or a pharmaceutically acceptable salt thereof:



(IA)

wherein one of the groups R_6, R_7 and R_8 are hydrogen and the other two are methyl, ethyl, n-propyl, methoxy, ethoxy or n-propoxy, and R_9 is hydrogen or lower alkyl.

4,065,458

EBURNAMENINE DERIVATIVES

Csaba Lorincz; Kalman Szasz; Maria Bolyos; Karola Jovanovics; Laszlo Szporny; Egon Karpati, and Eva Palosi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

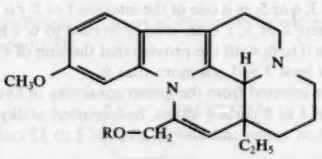
Filed June 9, 1976, Ser. No. 694,204

Claims priority, application Hungary, June 10, 1975, RI 566

Int. Cl.[2] C07D *471/22*

U.S. Cl. 260—293.55 **12 Claims**

1. A compound of the formula



(I)

wherein

R is hydrogen or a C_{1-15} alkylcarbonyl, C_{2-6} alkenylcarbonyl, or a phenyl-(C_{1-5})-alkylcarbonyl or a benzoyl group unsubstituted or substituted with halogen, trihalomethyl, C_{1-4} alkoxy or nitro or a pharmaceutically acceptable acid addition and quaternary salt.

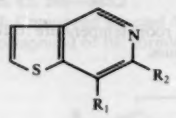
4,065,459

PROCESS FOR THE PREPARATION OF THIENO(3,2-C) PYRIDINE AND DERIVATIVES THEREOF

Alan Heymes, Portet sur Garonne, and Jean-Pierre Maffrand, Toulouse, both of France, assignors to Parcor, Paris, France

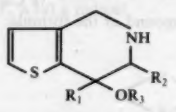
Filed Feb. 6, 1976, Ser. No. 655,966
Claims priority, application France, May 30, 1975, 75.17009
Int. Cl.[2] C07D *283/00*
U.S. Cl. 260—294.8 C 6 Claims

1. Process for the preparation of compounds having the formula:



(I)

in which R_1 is selected from the group consisting of hydrogen and the alkyl groups having 1–6 carbon atoms and R_2 is selected from the group consisting of hydrogen and the lower alkyl groups having 1–6 carbon atoms, comprising reacting at room temperature in methylene chloride or chloroform as a solvent and in the presence of a hydrohalic acid binding agent, a compound of the formula (II):

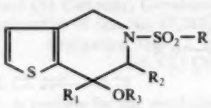


(II)

in which the radicals R_1 and R_2 having the above-defined meanings and R_3 is selected from the group consisting of hydrogen, an alkyl group, a substituted alkyl group, a benzyl radical and a substituted benzyl radical, with a halosulfonated derivative of the formula:

$$Hal - SO_2 - R \quad (III)$$

in which Hal represents halogen and R is selected from the group consisting of the alkyl groups, the substituted alkyl groups, the aryl groups, the substituted aryl groups, the aralkyl groups and the substituted aralkyl groups, to give a N-substituted derivative having the formula:



(IV)

in which the various symbols having the above-defined meanings and heating the sulfonated derivative of the formula (IV) in an organic solvent selected from dioxane and the lower alkanols at refluxing temperature in the presence of an acid, to give the compound of the formula (I).

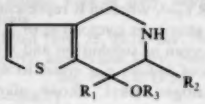
4,065,460

4,5,6,7-TETRAHYDRO-THIENO[3,2-c]-PYRIDINE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Alain Heymés, Portet-sur-Garonne, and Jean-Pierre Maffrand, Toulouse, both of France, assignors to Parcor, Paris, France

Filed Apr. 6, 1976, Ser. No. 674,734
Claims priority, application France, May 28, 1975, 75.16635
Int. Cl.[2] C07D *513/04*
U.S. Cl. 260—294.8 C 6 Claims

1. A compound selected from the group consisting of 4,5,6,7-tetrahydro-thieno[3,2-c]-pyridine derivatives having the formula:



(I)

in which R_1 is selected from the group consisting of hydrogen and the alkyl radicals having 1–6 carbon atoms; R_2 is selected from the group consisting of hydrogen, an alkyl group having 1–6 carbon atoms, the phenyl radical, and the benzyl radical; R_3 is selected from the group consisting of an alkyl group having 1–6 carbon atoms, and the benzyl radical; and the pharmaceutically acceptable acid addition salts of said derivatives.

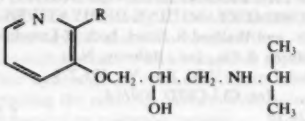
4,065,461

AMINO CONTAINING PYRIDYLOXY PROPANOLS

Karl Jakob Ross-Petersen, Farum, Denmark, assignor to Aktieselskabet Grindstedvaerket, Arhus N, Denmark

Filed Aug. 10, 1976, Ser. No. 713,166
Claims priority, application United Kingdom, Aug. 12, 1975, 33474/75
Int. Cl.[2] C07D *213/65, 213/73*
U.S. Cl. 260—296 AE 3 Claims

1. A compound selected from the group consisting of



(I)

wherein R denotes a hydrogen atom or an amino group, and acid addition salts thereof.

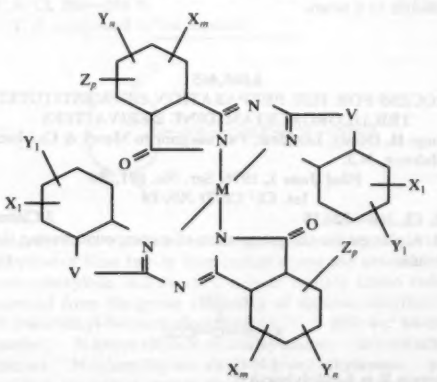
4,065,462

IMINOISOINDOLINONE METAL COMPLEX

Christoph Frey, Aesch, and Jost von der Crone, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 6, 1975, Ser. No. 619,889
Claims priority, application Switzerland, Oct. 17, 1974, 13919/74
Int. Cl.[2] C07D *209/44*
U.S. Cl. 260—299 8 Claims

1. An iminoisoindolinone metal complex of the formula



wherein M represents zinc, cadmium, cobalt, copper and nickel; X represents hydrogen; Y represents halogen; Z represents nitro, alkoxycarbonyl containing 2 to 6 carbon atoms, or a group of the formula RY_2—, wherein R represents hydrogen, alkyl of 1 to 6 carbon atoms, or cycloalkyl of 5 to 6 carbon atoms; Y_2 represents oxygen or sulphur; *m* and *n* are 0 to 4, *p* is 0 to 2, and the sum of $m+n+p$ is equal to 4; X_1 and Y_1 represent hydrogen, halogen, alkyl, alkoxy, alkoxycarbonyl alkylsulphonyl, alkylcarbamoyl groups of 1 to 6 carbon atoms, nitro, carbamoyl, or the radicals X_1 and Y_1 form a fused benzene ring.

4,065,463

HERBICIDAL 2-METHYL-4-PHENYL-5-ISOXAZOLINONES

James Richard Beck, and Robert Peter Gajewski, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 639,749, Dec. 11, 1975, Pat. No. 4,000,155. This application Sept. 27, 1976, Ser. No. 726,726

Int. Cl.[2] C07D *261/12*

U.S. Cl. 260—307 A **1 Claim**

1. The compound 2-methyl-4-(α,α,α-trifluoro-m-tolyl)-3-isoxazolin-5-one.

4,065,464

PROCESS FOR THE PREPARATION OF SUBSTITUTED TRICHLOROACETAMIDINE DERIVATIVES

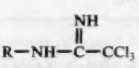
George H. Denny, and Walfred S. Saari, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 1, 1976, Ser. No. 691,279

Int. Cl.[2] C07D *209/14*

U.S. Cl. 260—326.15 **5 Claims**

1. A process for the preparation of a compound having the formula:



wherein R is 3-indolylmethyl, which comprises treating with trichloroacetamidine a compound having the formula:

R-G

wherein R is as previously defined and G is a leaving group selected from a halide, an amine substituted with two groups selected from loweralkyl or aromatic hydrocarbon and loweralkyl quaternary derivatives thereof; pyridyl, loweralkylsulfonate and an aromatic sulfonate at reflux temperature for from 5 minutes to 6 hours.

4,065,465

PROCESS FOR THE PREPARATION OF SUBSTITUTED TRICHLOROACETAMIDINE DERIVATIVES

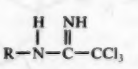
George H. Denny, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed June 1, 1976, Ser. No. 691,280

Int. Cl.[2] C07D *209/14*

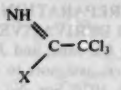
U.S. Cl. 260—326.15 **3 Claims**

1. A process for the preparation of a compound having the formula:



wherein R is 3-indolylmethyl;

which comprises treating a compound having the formula:



wherein

X is amino or loweralkoxy; with a compound having the formula:

$R—NH_2$

wherein

R is as previously defined, at from room temperature to 100° C for from 30 minutes to 40 hours.

4,065,466

INTEGRATED PROCESS FOR THE PREPARATION OF 2-DIALKOXYPHOSPHINYLIMINO-1,3-DITHIETANE

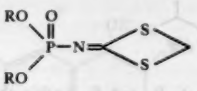
David William Reger, Trenton; Murray Garber, and Don Wesley Long, both of Lawrenceville, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 14, 1976, Ser. No. 695,667

Int. Cl.[2] C07D *339/00*

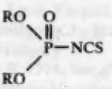
U.S. Cl. 260—327 M **11 Claims**

1. A process for preparing a compound of the formula:

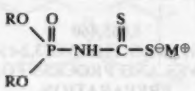


wherein R is alkyl C_1–C_4 comprising the steps of: (a) reacting a compound of formula:

wherein R is as defined above with an anhydrous thiocyanate selected from sodium, potassium and ammonium thiocyanate at a temperature range of 5° C to 30° C to obtain a compound of formula:



wherein R is as defined above (b) reacting the latter thus-formed compound with a hydrosulfide selected from the group consisting of sodium hydrosulfide, potassium hydrosulfide and ammonium hydrosulfide in an aqueous environment containing a non-ionic surfactant at a temperature range of 5° C to 30° C to obtain a compound of the formula:



wherein R is as defined above and M is sodium, potassium or ammonium; (c) reacting the thus-formed compound with a methylene halide selected from methylene bromide and methylene iodide in an aqueous environment at a temperature range of 25° C to 45° C and a pH range of 5 to 8, and (d) recovering desired product.

4,065,467

5:6-BENZO γ-PYRONE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Gianfederico Doria; PierNicola Giraldi; Francesco Lauria; Maria Luisa Corno, all of Milan; Piero Sberze, Varese, and Marcello Tibolla, Milan, all of Italy, assignors to Carlo Erba, S. p. A., Milan, Italy

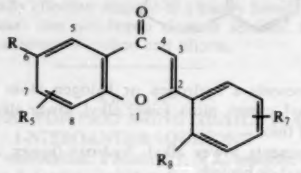
Continuation of Ser. No. 536,476, Dec. 26, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,383

Claims priority, application Italy, Dec. 27, 1973, 32089/73; July 4, 1974, 24777/74; July 17, 1974, 25244/74

Int. Cl.[2] C07D *311/02, 249/02;* A61K *31/35, 31/41*

U.S. Cl. 260—345.2 28 Claims

1. Compound selected from the group consisting compound of the formula:



wherein R is carboxy or —$COOR_{13}$, wherein R_{13} is C_1–C_{12} alkyl; R_5 is hydrogen, allyl or propyl; R_8 is (a) a radical

wherein each of R_{10} and R_{11} are hydrogen or C_1–C_6 alkyl, (b) a radical —$(O)_m$—R_{14}, wherein *m* is 0 or 1 and R_{14} is C_1–C_6 alkyl which may be unsubstituted or substituted with hydroxy or C_1–C_6 alkoxy; and R_7 is hydrogen; and a pharmaceutically acceptable salt thereof.

4,065,468

MANUFACTURE OF MALEIC ANHYDRIDE FROM BUTANE

Robert K. Grasselli, Cleveland; Dev D. Suresh, Macedonia, and Robert C. Miller, Northfield, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 67,269, Aug. 26, 1970, abandoned. This application May 12, 1976, Ser. No. 685,879

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.75 11 Claims

1. A process for the production of maleic anhydride by the oxidation of n-butane with molecular oxygen or a molecular oxygen-containing gas at a reaction temperature of 300° C to 600° C, in the presence of a catalyst described by the formula

$$A_aB_bSb_cMo_dO_e$$

wherein

A is at least one member selected from the group consisting of Fe and V;

B is at least one member selected from the group consisting of Al, Cr, Co, Ni, Cu, Bi, Te, B, P, Ti and W;

a is a number from 0.1 to 6;

b is a number from 0 to 3;

c is a number from 0.1 to 12;

d is a number from 12 to 1;

e is a number determined by the valence requirements of the combined elements other than oxygen present in the catalyst.

4,065,469

PROCESS FOR THE SYNTHESIS OF DIBENZOFURAN

Pietro Antonio Moggi, Milan, and Giuseppe Iori, San Donato Milanese (Milan), both of Italy, assignors to ANIC, S.p.A., Palermo, Italy

Filed Nov. 25, 1975, Ser. No. 635,235

Claims priority, application Italy, Nov. 25, 1974, 29771/74

Int. Cl.[2] C07D *307/91*

U.S. Cl. 260—346.71 10 Claims

1. The process of synthesizing dibenzofuran which comprises subjecting 2-cyclohexenylcyclohexanone to oxidative dehydrocyclization at high temperatures in the presence of a dehydrocyclization catalyst which is a member of the group consisting of the oxides and blends of oxides of the metals belonging to groups III, IV, V, VI, and VIII, and an oxidizing agent.

4,065,470

PROCESS FOR PRODUCING MALEIC ANHYDRIDE FROM MIXTURE OF FIVE AND SIX CARBON HYDROCARBONS

John D. Bacha, Monroeville; Joseph S. Matthews, Pittsburgh, and Charles M. Selwitz, Monroeville, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 13, 1976, Ser. No. 714,047

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.75 9 Claims

1. A process for preparing maleic anhydride from a hydrocarbon mixture containing C_5 monoolefinic hydrocarbons, C_5 cyclic and acyclic diolefinic hydrocarbons, C_5 paraffins, C_6 paraffins and benzene which comprises separating C_5 cyclic diolefinic hydrocarbons from said hydrocarbon mixture and then reacting the resulting mixture with molecular oxygen in the presence of an oxidation catalyst.

4,065,471

N-(4-AMINO-2-BUTYNYL)IMIDES

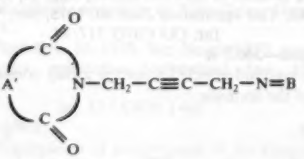
William B. Dickinson, Colonie, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 5,368, Jan. 23, 1970, abandoned, and a continuation-in-part of Ser. No. 881,302, Dec. 1, 1969, abandoned, which is a continuation-in-part of Ser. No. 650,587, July 3, 1967, abandoned, and a continuation-in-part of Ser. No. 650,633, July 3, 1967, abandoned, each is a division of Ser. No. 447,105, April 9, 1965, Pat. No. 3,354,178. This application Sept. 14, 1970, Ser. No. 72,169

Int. Cl.[2] C07D *207/12, 207/06, 211/88*

U.S. Cl. 260—326 N 8 Claims

1. A compound of the formula



wherein A′ is a member of the group consisting of divalent alkylene of from two to four carbon atoms and unsubstituted orthophenylene, and N=B is a basic tertiary amino radical selected from the group consisting of di(lower-alkyl)amino, N-lower-alkyl-N-lower-alkenylamino, di(lower-alkenyl-)amino, N-lower-alkyl-N-cycloalkylamino, di(cycloalkyl-)amino, N-(phenyl-lower-alkyl)-N-lower-alkylamino, pyrrolidino, piperidino, morpholino, and thiamorpholino.

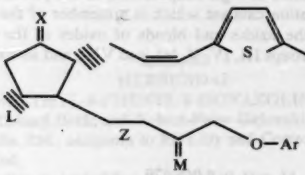
4,065,472

5-(2-CARBOXYTHIOPHEN-5-YL)-16-ARYLOXY-α-TETRANOR-ω-TETRANORPROSTAGLANDINS

Thomas K. Schaaf, Old Lyme, and Jasjit Singh Bindra, Groton, both of Groton, Conn., assigner to Pfizer Inc., New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,481
Int. Cl.[2] C07D *333/24;* A01N *9/00*
U.S. Cl. 260—332.2 C 7 Claims

1. An optically active compound of the structure



the optical antipode and the racemic mixture thereof wherein M and X are selected from the group consisting of

and keto;

Z is a trans double bond or single bond;

R is selected from the group consisting of hydrogen, alkyl of from one to ten carbon atoms, cycloalkyl of from three to eight carbon atoms, phenyl, phenylalkyl of from seven to nine carbon atoms and substituted phenyl wherein said substituent if fluoro, chloro, bromo, iodo, alkyl and alkoxy of from one to six carbon atoms, and phenyl;

L is selected from the group consisting of hydrogen and hydroxyl; and

Ar is selected from the group consisting of phenyl, α-naphthyl, β-naphthyl and monosubstituted phenyl wherein said substituent is selected from the group consisting of fluoro, chloro, bromo, trifluoromethyl, phenyl, and alkyl and alkoxy of from one to six carbon atoms.

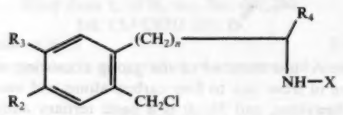
4,065,473

INTERMEDIATES IN THE PREPARATION OF 2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINES

Arnold Brossi, Verona; Benjamin Pecherer, Montclair, and Robert Sunbury, Wayne, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 402,536, Oct. 1, 1973, Pat. No. 3,906,006, which is a division of Ser. No. 65,340, Aug. 19, 1970, Pat. No. 3,795,683. This application June 20, 1975, Ser. No. 588,985
Int. Cl.[2] C07D *317/44*
U.S. Cl. 260—340.5 R 2 Claims

1. A compound selected from the group consisting of compounds of the formula



wherein R_2 and R_3 taken together signify methylenedioxy; R_4 signifies hydrogen, lower alkyl, carboxy, aryl or aryl substituted by a member selected from the group consisting of halogen, lower alkyl, nitro, or trifluoromethyl; n is 1 or 2; and X is acetyl.

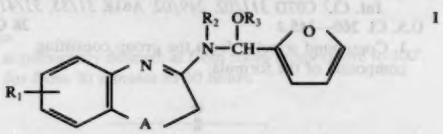
4,065,474

1,4-BENZODIAZEPINE-2-AMINE DERIVATIVES

Umakant Devdas Shenoy, London, England, assignor to DDSA Pharmaceuticals Limited, Leicester, England

Filed May 24, 1976, Ser. No. 689,303
Claims priority, application United Kingdom, May 22, 1975, 22057/75
Int. Cl.[2] C07D *405/12*
U.S. Cl. 260—347.7 6 Claims

1. A benzodiazepine derivative of the formula I



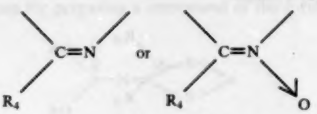
in which

R_1 represents a hydrogen or halogen atom or trifluoromethyl, cyano, nitro, lower alkyl, lower alkoxy or lower alkyl thio;

R_2 represents lower alkyl, hydroxy-(lower alkyl), lower alkenyl or benzyl;

R_3 represents lower alkyl; and

—A— represents a grouping of the formula:



in which R_4 represents phenyl, (lower alkyl)-phenyl, nitrophenyl, halophenyl or pyridyl.

4,065,475

PROCESS FOR PREPARING CIS-EPOXYSUCCINIC ACID SALTS OF HIGH PURITY

Kazuo Hosoi; Norio Kawabe, and Masaji Ohno, all of Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 605,552, Aug. 7, 1975, abandoned. This application May 21, 1976, Ser. No. 688,920
Int. Cl.[2] C07D *301/12*
U.S. Cl. 260—348.31 8 Claims

1. A continuous process for preparing a highly pure cis-epoxysuccinic acid salt, comprising the steps of:

a. conducting an epoxidation reaction by contacting and reacting a maleic acid salt with hydrogen peroxide in the presence of a tungstate or molybdate catalyst to form an aqueous epoxidation reaction solution;

b. contacting said aqueous epoxidation reaction solution with a Type II strongly basic anion exchange resin in the neutralized form at a pH lower than about 7 to selectively adsorb said catalyst;

c. contacting said resin with an alkali metal hydroxide to recover said catalyst in the form of an aqueous solution,

d. treating said recovered catalyst solution with a calcium ion source at a pH of about 7.0–8.5, and

e. adding maleic acid or maleic anhydride and hydrogen peroxide into said recovered catalyst solution to form another epoxidation reaction solution whereby the catalyst is recycled and the resin is regenerated to provide a continuous process.

4,065,476

BORIDE CATALYST FOR EPOXIDIZING OLEFINIC COMPOUNDS

Robert Malone Gipson, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 565,004, April 4, 1975. This application July 9, 1976, Ser. No. 703,866

Int. Cl.[2] C07D *301/20*

U.S. Cl. 260—348.29 5 Claims

1. A method for the liquid phase epoxidation of an olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide comprising the step of:

intimately contacting said olefin with said organic hydroperoxide at lower temperatures of about 25° C to about 200° C and pressures sufficient to maintain the product and reactants substantially in liquid phase in the presence of a catalytically effective amount of a binary boride of boron and at least one non-boron element selected from the group consisting of carbon and silicon.

4,065,477

PROCESS FOR PREPARING HIGHLY PURE 1-NITROANTHRAQUINONE

Thurairajah Padmanathan, Piscataway, N.J., assignor to Bisonwerke Bahre & Greten GmbH & Co. KG, Stamford, Conn.

Filed Oct. 29, 1976, Ser. No. 736,663

Int. Cl.[2] C07C *49/68;* C09B *1/04*

U.S. Cl. 260—369 3 Claims

1. A process for preparing 1-nitroanthraquinone comprising the steps of:

1. oxidizing 3-nitro-o-xylene to form 2-methyl-3-nitrobenzoic acid,
2. converting said 2-methyl-3-nitrobenzoic acid to a 2-methyl-3-nitrobenzoyl halide,
3. reacting said 2-methyl-3-nitrobenzoyl halide with benzene in the presence of a suitable Friedel Crafts catalyst to form 2-methyl-3nitrobenzophenone,
4. oxidizing said 2-methyl-3-nitrobenzophenone to form 2-benzoyl-6-nitrobenzoic acid, and
5. cyclizing said 2-benzoyl-6-nitrobenzoic acid in a sutiable inorganic acid to form 1-nitroanthraquinone and recovering the same therefrom.

4,065,478

PROCESS FOR THE MANUFACTURE OF α,α′-AMINONITROANTHRAQUINONES

Zdenek Seha, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Dec. 15, 1975, Ser. No. 640,372

Claims priority, application Switzerland, Dec. 19, 1974, 16978/74

Int. Cl.[2] C07C *97/24*

U.S. Cl. 260—382 10 Claims

1. A process for the manufacture of α,α′-aminonitroanthraquinone from an α,α′-dinitroanthraquinone with a selectivity of at least about 70% comprising the step of reacting an α,α′-dinitroanthraquinone with ammonia in a dipolar aprotic solvent which is inert to ammonia, the reaction substrate and the reaction product said ammonia being present in excess of, at most, about 50% over the stoichiometric amount.

4,065,479

METHOD OF SYNTHESIS OF PI-ALLYL-PALLADIUM COMPOUNDS

Richard Craig Larock, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

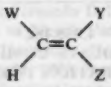
Filed Apr. 30, 1976, Ser. No. 681,784

Int. Cl.[2] C07F *15/00*

U.S. Cl. 260—429 L 18 Claims

1. A method of preparing pi-allyl-palladium compounds, said method comprising:

reacting a vinylmercuric salt the anion of said salt being selected from the group consisting of nitrate, acetate, sulfate, phosphate, and halide, with an olefin of the formula:



wherein W, Y and Z are selected from the group consisting of aliphatic, alicyclic and aromatic organic radicals, and a palladium (II) salt to provide carbon-carbon bond formation between carbon atoms of said vinylmercuric salt and said olefin.

4,065,480

PROCESS FOR PREPARING SUBSTITUTED CYCLOPROPYCARBINYL COMPOUNDS

Donald John Peterson, Cincinnati, and Medford Dwight Robbins, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 586,456, June 12, 1975, Pat. No. 3,998,889, which is a division of Ser. No. 390,156, Aug. 23, 1973, Pat. No. 3,959,324, which is a continuation-in-part of Ser. No. 247,641, April 26, 1972, abandoned. This application June 24, 1976, Ser. No. 699,414

Int. Cl.[2] C07F *3/06*

U.S. Cl. 260—429.9 7 Claims

1. A process for preparing substituted cyclopropylcarbinyl compounds of the formula

wherein each R is a member selected from the group consisting of hydrogen, alkyl, aryl, alkenyl, substituted alkyl, substituted aryl and substituted alkenyl substituents, and E is a substituent derived from an electrophile source selected from the group of inorganic compounds consisting of Cl_2, Br_2, I_2, $HgCl_2$, $ZnCl_2$, $AlCl_3$, NOCl, SO_3, and HCl, comprising admixing an organotin compound of the formula

$$(CR_2 = CRCR_2CR_2)_x SnR_{4-x}^1$$

wherein x is an integer of from 1–4 and R^1 is an alkyl substituent, with said electrophile source.

4,065,481

1:1-AZOMETHINE-METAL-COMPLEX DYESTUFFS

François L'Eplattenier, Therwil, and Laurent Vuitel, Monthey, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

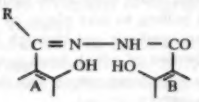
Filed Dec. 12, 1975, Ser. No. 640,373

Claims priority, application Switzerland, Dec. 17, 1974, 16810/74

Int. Cl.[2] C07F *1/08*

U.S. Cl. 260—438.1 6 Claims

1. 1:1-Metal complexes of azomethines of the formula I



(I)

wherein A and B are isocyclic aromatic groups, with however only one of the groups A and B being a benzene ring, R represents a hydrogen atom, an alkyl group containing 1 to 6 carbon

atoms, or an aryl group, and the complexing metal ions are bivalent cations of zinc, copper, nickel, colialtor cadmium.

4,065,482

SILOXANEDIOLATE COMPLEXES AND PREPARATION THEREOF

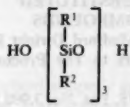
Terry G. Selin, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 581,146, May 27, 1975, Pat. No. 4,003,917, which is a division of Ser. No. 602,490, Dec. 19, 1966, Pat. No. 3,923,834. This application Feb. 23, 1976, Ser. No. 677,114

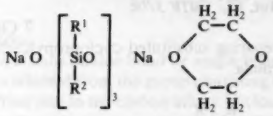
Int. Cl.² C07F *7/08*

U.S. Cl. 260—448.2 E **1 Claim**

1. The process for the preparation of an aryl polysiloxanediol having the general formula



wherein R^1 and R^2 are aryl radicals which comprise: acidifying a siloxanediolate complex having the formula,



with an acid having a hydrogen ion concentration of less than about 2 molar.

4,065,483

METHANOL

Alwyn Pinto, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 24, 1975, Ser. No. 590,012

Claims priority, application United Kingdom, July 2, 1974, 29260/74

Int. Cl.² C07C *29/16, 31/06*

U.S. Cl. 260—449.5 **12 Claims**

1. A methanol production process which comprises:

a. generating methanol synthesis gas by reacting a carbonaceous feedstock with steam in one or more stages at the outlet of which there is delivered a gas stream at over 400° C;

b. generating steam at a pressure of at least 50 ata by passing water in heat exchange with the gas stream of stage (a);

c. bringing synthesis gas to synthesis pressure in the range 30 to 400 ata by means of a compressor driven by an engine in which such steam is let down;

d. synthesizing methanol from synthesis gas by passing synthesis gas from stage (c) over a catalyst containing copper and zinc oxide at an outlet temperature of under 300° C;

e. transferring heat evolved in the methanol synthesis of stage (d) from methanol-containing synthesis gas effluent to water to heat said water to a temperature in the range 200° C to 260° C, said water maintained under a pressure too high to permit boiling to take place, by passing said methanol-containing synthesis gas through two parallel heat exchangers, the first of which heats synthesis gas to methanol synthesis inlet temperature and the second of which heats said water;

f. passing the hot water from stage (e) to stage (b) as a water source in the heat exchange for steam generation; and

g. recovering methanol from the cooled methanol-containing synthesis gas from stage (e).

4,065,484

METHANATION PROCESS WITH INTERMITTENT REACTIVATION OF CATALYST

Harry H. Dobashi, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 630,977, Nov. 12, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 748,134

Int. Cl.² C07C *1/04, 1/16*

U.S. Cl. 260—449.6 M **10 Claims**

1. A methanation process wherein:

1. a stream of contaminated feed gas comprising hydrogen and carbon monoxide and/or carbon dioxide is contacted with a nickel-alumina catalyst at temperatures between about 600° and 1500° F to produce methane;

2. said catalyst has a total nickel content between about 15 and 60% by weight, calculated as Ni, one portion of said nickel content being in an active metallic state, and another portion thereof being nickel aluminate, the nickel specific surface area of said catalyst in its freshly reduced state being between about 5 and 50 m^2/gm of Ni;

3. said feed gas is contaminated with H_2S or a sulfur compound which yields H_2S upon hydrogenation, whereby said catalyst becomes at least partially deactivated;

4. said deactivated catalyst is reactivated with essentially no removal of sulfur therefrom by contacting the same with a substantially sulfur-free stream of reactivating gas consisting essentially of hydrogen, said reactivation contacting being carried out at between about 800° and 1500° F and continued for at least about 5 hours; and

5. the resulting reactivated catalyst is again placed on-stream for methanation as defined in (1) above.

4,065,485

CYCLITOLAMINES

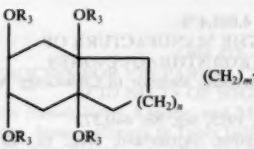
Frederic P. Hauck, Somerville, and Joyce Reid, Highland Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 26, 1976, Ser. No. 735,855

Int. Cl.² C07C *121/47, 69/02*; A61K *31/13*

U.S. Cl. 260—464 **9 Claims**

1. A compound having the formula



or a pharmaceutically acceptable acid-addition salt thereof, wherein R_1 is alkyl or arylalkyl; R_3 is alkanoyl of 1 to 7 carbon atoms; m is 1, 2, 3 or 4; n is 1, 2 or 3; and p is 0, 1, 2 or 3; wherein aryl is phenyl or phenyl substituted with one or two halogen, alkyl or alkoxy groups; and alkyl and alkoxy are groups having 1 to 6 carbon atoms.

4,065,486

PROCESS FOR RECOVERY OF PRODUCTS FROM A WASTE STREAM IN THE MANUFACTURE OF ACRYLONITRILE

John Anton Thorpe, Memphis, Tenn., and Harold Felton Porter, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 13, 1976, Ser. No. 722,514

Int. Cl.² C07C *120/14, 120/00*

U.S. Cl. 260—465.3 **7 Claims**

1. A process for the recovery of reactants and products contained in dilute aqueous stream from the waste water column of a process for the production of acrylonitrile by ammoxidation of propylene while concentrating said stream which reactants and products comprise hydrogen cyanide, acryloni-

trile, ammonia, ammonium sulfate, and high boiling nitrogen containing impurities said process comprising mixing said dilute stream with a stream from the same source as said dilute stream partially concentrated by having a portion of the water removed therefrom passing the mixture obtained through a heat exchanger at a velocity of at least 6 ft/sec while maintaining said mixture in the liquid state to thereby heat the mixture to at least 105° C and thereafter rapidly reducing the pressure of the heated mixture sufficiently to vaporize a portion of said mixture and thereafter returning said vapor to said acrylonitrile process while withdrawing a portion of the unvaporized stream.

4,065,487

PROCESS FOR PRODUCING BENZONITRILE

Ramiz Gasan Kuli ogly Rizaev, ulitsa Sharif-zade, 148, blok 5, kv. 67; Soltan Dzhafarovich Mekhtiev, ulitsa Khagani, 26/32, blok 5, kv. 92; Zemfira Jusif kyzy Magerramova, ulitsa E.-Saratovtsa, 3/5, kv. 14; Viktor Efimovich Sheinin, ulitsa Pervomaiskaya, 251, blok 2, kv. 28; Mirabdulla Mirakhmed ogly Mirataev, ulitsa Khanlara, 24, kv. 24, and Idris Aslan ogly Guseinov, Kirovsky raion, poselok Khodzhi Gasan, ulitsa A. Matrosova, 28, all of Baku, U.S.S.R.

Filed July 21, 1976, Ser. No. 707,426
Int. Cl.[2] C07C *120/14*
U.S. Cl. 260—465 C 3 Claims

1. A process for producing benzonitrile comprising reacting toluene with ammonia at a temperature within the range of from 340° to 480° C in the presence of oxygen or a mixture thereof with inert gases and a catalyst, viz. a mixture of oxides of vanadium, chromium, antimony and bismuth taken in a molar ratio of 1–10:1–20:1–10:1–15 respectively deposited onto a carrier, followed by isolation of the desired product.

4,065,488

PROCESS FOR PREPARING 1,4:3,6-DIANHYDRO-D-GLUCITOL 2-NITRATE

Chih H. Chou, Dollard des Ormeaux, and Gordon S. Myers, Mount Royal, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,860
Int. Cl.[2] C07C *77/02*
U.S. Cl. 260—467 6 Claims

1. A process for preparing 1,4:3,6-dianhydro-D-glucitol 2-nitrate which comprises the steps of:

a. acetylating 1,4:3,6-dianhydro-D-glucitol with 0.5 to 1.5 molar equivalents of acetic anhydride in the presence of an acid catalyst to obtain a mixture of 1,4:3,6-dianhydro-D-glucitol 5-acetate, 1,4:3,6-dianhydro-D-glucitol 2-dianhydro-D-glucitol 2,5-diacetate;

b. nitrating the latter mixture with a mixture of nitric acid and acetic anhydride to obtain a mixture of 1,4:3,6-dianhydro-D-glucitol 5-acetate 2-nitrate, 1,4:3,6-dianhydro-D-glucitol 2-acetate 5-nitrate and 1,4:3,6-dianhydro-D-glucitol 2,5-diacetate; and

c. hydrolyzing the latter mixture in the presence an aqueous solution of an inorganic base to obtain a mixture of 1,4:3,6-dianhydro-D-glucitol 2-nitrate and 1,4:3,6-dianhydro-D-dlucitol 5-nitrate in a ratio greater than 2:1 **and isolating** 1,4:3,6-dianhydro-D-glucitol 2-nitrate.

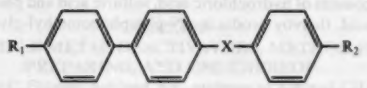
4,065,489

BIPHENYL ESTERS AND LIQUID CRYSTALLINE MIXTURES COMPRISING THEM

Rolf Steinstrasser, and Fernando Del Pino, both of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Oct. 21, 1975, Ser. No. 624,400
Claims priority, application Germany, Oct. 22, 1974, 2450088; Aug. 6, 1975, 2535046
Int. Cl.[2] C07C *69/76*
U.S. Cl. 560—59 14 Claims

1. A biphenyl ester of the formula



wherin X is —CO—O— or —O—CO— and R_1 and R_2 each are alkyl or alkoxy of 1–8 carbon atoms.

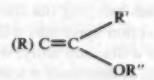
4,065,490

PROCESS FOR THE PREPARATION OF OXALATE ESTERS FROM CARBON MONOXIDE AND AN ENOL ETHER

Lee R. Zehner, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 22, 1976, Ser. No. 669,376
The portion of the term of this patent subsequent to Jan. 17, 1995, has been disclaimed.
Int. Cl.[2] C07C *69/36*
U.S. Cl. 560—204 23 Claims

1. An process for the preparation of oxalate esters which comprises reacting under substantially anhydrous conditions an enol ether having the formula



wherein R and R′ may be hydrogen, an alkyl, alicyclic, aralkyl or aryl group, and R″ is an alkyl or aralkyl group, which R and R′, except when hydrogen, and R″ may contain other substitutents which do not interfere with the reaction, with carbon monoxide, a monohydric alcohol, having the formula R″OH wherein R″ is defined above and oxygen, at a pressure of between about 500 psig and 3000 psig and at a temperature in the range of about 50° C. to 200° C. in the presence of an effective amount of a catalyst selected from the group consisting of palladium, platinum, rhodium, cadmium, cobalt, zinc and copper salt compounds or mixtures thereof, and a catalytic amount of

a. an aliphatic, cycloaliphatic, aromatic or heterocyclic amine or ammonia,

b. a copper (II) or iron (III) oxidant salt compound, and

c. an ammonium or substituted ammonium salt compound, and recovering the desired oxalate ester.

4,065,491

PROCESS FOR THE PREPARATION OF N-PHOSPHONOMETHYL-GLYCINE

Tódor Pfliegel; Jenö Seres; Antal Gajáry; Klára Daróczy nee Csuka, and Lajos T. Nagy, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Continuation of Ser. No. 588,231, June 19, 1975, abandoned. This application Jan. 12, 1977, Ser. No. 758,790
Claims priority, application Hungary, June 27, 1974, 2251
Int. Cl.[2] C07F *9/38*
U.S. Cl. 260—502.5 2 Claims

1. A process for the preparation of N-phosphonomethyl-glycine comprising the steps of:

a. reacting formaldehyde and glycine in an aqueous alkali-

metal hydroxide medium in substantially equimolar quantities at a temperature of −5° to +15° C;

b. adding to the reaction system of step (a) an amount of dimethyl or diethyl phosphite substantially equimolar to the glycine and formaldehyde;

c. heating the reaction system of step (b) to a temperature of 50° to 100° C to form N-phosphonomethyl-glycine dimethyl or diethylester; and

d. hydrolyzing the diester formed in step (c) by adding to the reaction system thereof at a temperature between 50° and 100° C a mineral acid selected from the group which consists of hydrochloric acid, sulfuric acid and phosphoric acid, thereby producing N-phosphonomethyl-glycine.

4,065,492

PROCESS FOR PREPARING AMINONAPHTHALENE DERIVATIVES IN A TITANIUM OR TITANIUM ALLOY REACTOR

Georg Spielberger, Leverkusen; Hermann Wunderlich, Odenthal-Hahnenberg; Günther Klag, Leverkusen, and Marko Zlokarnik, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 22, 1976, Ser. No. 698,563

Claims priority, application Germany, July 12, 1975, 2531281

Int. Cl.² C07C *85/06*

U.S. Cl. 260—508 **9 Claims**

1. In a process for preparing aminonaphthalene derivatives wherein the corresponding naphthol derivative is reacted with ammonia or amines in the presence of bisulfites, the improvement which comprises carrying out the reaction in a continuous procedure in reaction apparatus which consists wholly or partly of titanium or a titanium alloy, wherein the elementary carbon content in the system used is less than 0.1% by weight.

4,065,493

DEPENTYL ANALOGUES OF 11-DEOXY-PROSTAGLANDIN E_1

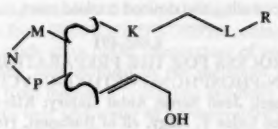
Harold Clinton Kluender, Madison, Wis., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 10, 1976, Ser. No. 684,569

Int. Cl.² C07C *177/00*

U.S. Cl. 260—514 D **2 Claims**

1. A compound of the formula,



wherein:

L is methylene, ethylene, or trimethylene;

K is ethylene;

M is carbonyl;

N is methylene;

P is methylene; and

R is: carboxyl; alkoxycarbonyl, the alkyl portion of said alkoxycarbonyl being a lower alkyl; or a pharmacologically acceptable non-toxic carboxy salt.

4,065,494

15-SUBSTITUTED PROSTANOIC ACIDS

Donald Peter Strike, St. Davids, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 569,026, April 17, 1975, Pat. No. 4,022,821, which is a division of Ser. No. 462,006, April 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 383,007, July 26, 1973, Pat. No. 3,922,302. This application Apr. 19, 1976, Ser. No. 678,284

Int. Cl.² C07C *177/00*

U.S. Cl. 260—514 D **3 Claims**

1. A compound which is 7-(2β-[(3RS)-3-ethynyl-3-hydroxy-trans-1-octenyl]-5β-hydroxy-1α-cyclopentyl)-cis-5-heptenoic acid.

2. A compound which is 2β-[(3RS)-3-ethynyl-3-hydroxyoctyl]-5β-hydroxy-1α-cyclopentane heptanoic acid.

3. A compound which is 2β-[(3RS)-3-ethynyl-3-hydroxy-trans-1-octenyl]-5β-hydroxy-1α-cyclopentane heptanoic acid.

4,065,495

δ-SUBSTITUTED NEGAMYCIN DERIVATIVES AND SYNTHESES

Hamao Umezawa, Tokyo, and Shinichi Kondo, Yokohama, both of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

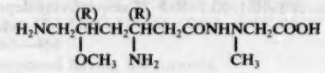
Filed Oct. 26, 1976, Ser. No. 735,352

Claims priority, application Japan, Nov. 11, 1975, 50-134710; Jan. 1, 1976, 51-000258

Int. Cl.² C07C *109/97*

U.S. Cl. 260—534 M **3 Claims**

1. The compound having the formula



wherein each symbol (R) indicates that the carbon atom beneath said symbol has the rectus configuration, or a nontoxic salt thereof.

4,065,496

TRANS-N-ACYL-N-ALKYL-1-AMINO-1,3-BUTADIENES, TRANS-N-ACYL-N-ARYL-1-AMINO-1,3-BUTADIENES AND PREPARATION THEREOF

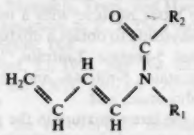
Wolfgang Oppolzer, Thonex, Switzerland, assignor to CHON Corporation, Cambridge, Mass.

Filed Jan. 7, 1976, Ser. No. 647,049

Int. Cl.² C07C *103/365*

U.S. Cl. 260—561 R **7 Claims**

1. A trans-compound of the formula



wherein R_1 is alkyl, alkylene, aryl or cycloalkyl and R_2 is alkyl or alkylene, wherein R_1 and R_2 each contain 1 to about 8 carbon atoms.

4,065,497

NOVEL DIBICYCLO [3.1.1] AND [2.2.1] HEPTYL AND DIBICYCLO [3.1.1] AND [2.2.1] HEPTENYL POLYAMINES

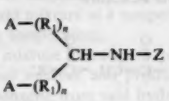
Nathaniel Grier, Englewood, N.J.; Richard A. Dybas, Center Square, Pa., and Robert A. Strelitz, Edison, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 671,922, March 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 620,721, Oct. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 540,620, Jan. 13, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,490

Int. Cl.[2] C07C *5/02, 87/02, 87/16*

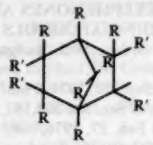
U.S. Cl. 260—563 P 36 Claims

1. A compound of the formula:



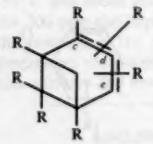
where:

each A is alike or different and is a [2.2.1] bicyclic group of the formula:



a)

or a [3.1.1] bicyclic group of the formula:

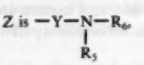


b)

where R is alike or different and is hydrogen or C_1 to C_4 alkyl, R′ is alike or different and is hydrogen or C_1 or C_4 alkyl or R′ on adjacent carbon atoms taken together comprise an olefinic bond, and the dashed line indicates either saturation or c-, d- or d-, e- unsaturation;

each R_1 is alike or different and is C_1 to C_4 alkylene:

each *n* is alike or different and is the integer 0 to 1;

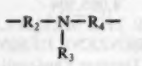


where

R_5 is hydrogen, aminoethyl or aminopropyl; C_1 to C_4 hydroxyalkyl, C_2 to C_4 dihydroxyalkyl; and

R_6 is hydrogen, C_1 to C_4 hydroxyalkyl; C_2 to C_4 dihydroxyalkyl;

Y is either



or —R_2— where

R_2 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

R_3 is hydrogen, C_1 to C_4 alkyl, C_1 to C_4 aminoalkyl or C_1 to C_4 hydroxyalkyl, C_2 to C_4 dihydroxyalkyl;

R_4 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

or when R_3 and R_6 taken together are ethylene, R_4 is also ethylene, and R_5 is aminoethyl, aminopropyl or aminohydroxypropyl, and acid addition salts thereof.

4,065,498

MULTIPLE METAL DEACTIVATORS, METHOD FOR PREPARING, AND USE THEREOF

Theodore C. Shields, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 557,001, March 10, 1975, Pat. No. 4,022,835. This application Jan. 12, 1977, Ser. No. 758,642

Int. Cl.[2] C07C *119/00*

U.S. Cl. 260—566 F 12 Claims

1. A method for making a metal deactivator composition comprising:

a. partially reacting in a liquid solvent at a temperature below about 200° C., an aliphatic polyamine selected from the the group consisting of ethylenediamine, 1,2-propanediamine, 1,2-diaminocyclohexane, 2,3-diaminobutane, 1,3-propanediamine, 1,3-butanediamine, 2,4-pentanediamine, 1,6-hexanediamine, diethylenetriamine and mixtures of these, with a beta-diketone selected from the group consisting of 2,4-pentanedione, 2,2,6,6-tetramethyl-3,5-heptanedione, 2,6-dimethyl-3,5-heptanedione, 3,5-heptanedione, 2,4-hexanedione, 5-methyl-2,4-hexanedione and 5,5-dimethyl-2,4-hexanedione; and

b. reacting the resulting product in a liquid organic solvent completely with salicylaldehyde at a temperature below about 60° C., the mole ratio of said beta-diketone to said aliphatic polyamine of (a) being between about 0.6 to 1 and about 1.4 to 1, the mole ratio of said salicylaldehyde of (b) to said aliphatic polyamine of (a) being between about 1.4 to 1 and about 0.6 to 1, and the ratio of the total moles of said beta-diketone and said salicylaldehyde to the total moles of said ethylenediamine being about 2 to 1.

4,065,499

LUBRICANT ADDITIVE

Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 395,221, Sept. 7, 1973, abandoned, which is a division of Ser. No. 255,223, May 19, 1972, Pat. No. 3,778,371, which is a continuation-in-part of Ser. No. 138,758, April 29, 1971, abandoned. This application Sept. 15, 1975, Ser. No. 613,343

Int. Cl.[2] C07C *87/00*

U.S. Cl. 260—567.6 M 6 Claims

1. A high molecular weight quaternary ammonium chloride having at least one substantially saturated poly-C_{2-4} olefin hydrocarbon group having an average molecular weight of from about 800 to about 1400 bonded to a quaternary ammonium nitrogen atom, the remaining groups bonded to said quaternary ammonium nitrogen atom being selected from the group consisting of C_{1-20} alkyl, C_{2-8} hydroxyalkyl and C_{3-20} alkenyl.

4,065,500
WATER-SOLUBLE QUATERNARY AMMONIUM AZO DYESTUFFS

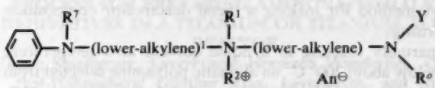
Patrick J. Jefferies, Erlanger, Ky., and Nathan N. Crounse, Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 486,180, July 5, 1974, Pat. No. 3,996,282, which is a continuation-in-part of Ser. No. 51,690, July 1, 1970, Pat. No. 3,839,426, which is a continuation-in-part of Ser. No. 777,884, Nov. 21, 1968, abandoned, which is a continuation-in-part of Ser. No. 551,868, May 23, 1966, abandoned, and Ser. No. 595,864, July 14, 1975, which is a continuation-in-part of Ser. No. 332,511, Feb. 14, 1973, Pat. No. 3,935,182, which is a continuation-in-part of Ser. No. 201,153, Nov. 22, 1971, Pat. No. 3,784,599, which is a continuation-in-part of Ser. No. 51,676, July 1, 1970, Pat. No. 3,709,903, which is a continuation-in-part of Ser. No. 777,884, , which is a continuation-in-part of Ser. No. 551,868,. This application Mar. 31, 1976, Ser. No. 672,428

Int. Cl.[2] C07C *87/30*

U.S. Cl. 260—567.6 M **5 Claims**

1. A compound of the formula



in which

R^0 is hydrogen, lower-alkyl or hydroxy-lower-alkyl;

R^1 is lower-alkyl, lower-alkenyl or hydroxy-lower-alkyl;

R^2 is lower-alkyl, lower-alkenyl, hydroxy-lower-alkyl or —(lower-alkylene)-NR^0Y;

R^7 is hydrogen or lower-alkyl;

Y is hydrogen or

wherein R is hydrogen, lower-alkyl, lower-alkenyl, phenyl or phenyl-lower-alkyl; and

An is an anion selected from the class consisting of halide, hydroxy and nitrate.

4,065,501
BASIC ENOL ETHER AND ACID ADDITION SALTS THEREOF

Peter Emig; Hans Pohle, both of Brackwede; Gerhard Scheffler, Senne; Norbert Brock, Uerentrup; Hans-Dieter Lenke, Ludwigshafen, and Jorg Pohl, Halle, all of Germany, assignors to Asta-Werke Aktiengesellschaft, Brackwede, Germany

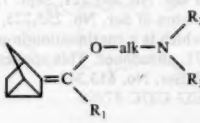
Filed Mar. 12, 1975, Ser. No. 557,535

Claims priority, application Germany, Mar. 22, 1974, 2413814

Int. Cl.[2] C07C *91/16*

U.S. Cl. 260—570.6 **4 Claims**

1. A compound selected from the group consisting of the basic enol ethers having the formula I



(I)

wherein R_1 represents a member selected from the group consisting of the unsubstituted phenyl group and the phenyl group substituted by members selected from the group consisting of halogen, lower alkyl having from 1 to 4 carbon atoms, nitro, trifluoromethyl, hydroxy and lower alkoxy having from 1 to 4 carbon atoms, alk is a member selected from the group consisting of the linear and branched alkylene groups having from 2 to 4 carbon atoms, and R_2 and R_3, which may be the same or different, represent members selected from the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms, and the pharmacologically acceptable acid addition salts.

4,065,502
CERTAIN β-DIKETONES AND THE USE THEREOF AS METAL EXTRACTANTS

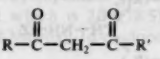
Kenneth D. MacKay, Circle Pines, and Edgar R. Rogier, Minnetonka, both of Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Division of Ser. No. 391,432, Aug. 24, 1973. This application Dec. 1, 1975, Ser. No. 636,773

Int. Cl.[2] C07C *49/76*

U.S. Cl. 260—590 R **3 Claims**

1. A compound of the structure



where R is phenyl and R′ is a branched chain alkyl group of 7 to 20 carbon atoms.

4,065,503
P-PHENOXY-ALKYLPHENONES AND CORRESPONDING ALCOHOLS

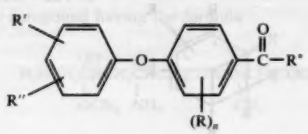
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 510,477, Sept. 30, 1974, Pat. No. 3,962,459, which is a continuation-in-part of Ser. No. 394,181, Sept. 4, 1973, abandoned. This application Feb. 27, 1976, Ser. No. 662,126

Int. Cl.[2] C07C *49/78, 49/84*

U.S. Cl. 260—592 **9 Claims**

1. A compound of the formula:



wherein

R^* is branched alkyl of 3 to 5 carbon atoms,

R is hydrogen, alkyl of 1 to 4 carbon atoms or halo of atomic weight of from 18 to 36,

n is 1 or 2,

R′ is hydrogen, alkyl of 1 to 4 carbon atoms, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms, and

R″ is hydrogen, alkyl of 1 to 4 carbon atoms, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms, provided that

i. when R, R′ and R″ each signifies hydrogen, then R^* signifies other than $—C(CH_3)_3$, $—CH(CH_3)_2$ or $—(CH_2)_2CH(CH_3)_2$ and

ii. when one of R′ and R″ signifies $CH_3O—$ in the 4-position and the other signifies hydrogen and R signifies hydrogen, then R^* signifies other than $—CH_2CH(CH_3)_2$.

4,065,504
PROCESS FOR THE METHYLATION OF HYDROXYBENZENE DERIVATIVES

David Michael Findlay, Terrasse Vaudreuil, Canada, assignor to Domtar Limited, W. Montreal, Canada

Filed June 4, 1976, Ser. No. 692,788

Int. Cl.[2] C07C *41/00, 45/00*

U.S. Cl. 260—600 R **10 Claims**

1. A method of preparing a carbonyl-substituted alkoxybenzene comprising

a. forming a mixture consisting essentially of a carbonyl-substituted hydroxybenzene, a dialkyl sulfate and sodium carbonate, said carbonyl-substituted hydroxybenzene being one of the class consisting of hydroxybenzaldehyde, di-hydroxybenzaldehyde, vanillin, hydroxyvanillin, syringealdehyde, hydroxyveratraldehyde, acetovanillone and aceto-syringeone, and said dialkyl sulphate being one of the group consisting of dimethyl sulfate and diethyl sulfate, the molar ratios of said dialkyl sulfate and of said sodium carbonate to said hydroxybenzine being, respectively, between 1.1 and 2 to 1 and between 1 and 2 to 1,

b. heating said mixture to a fluidizing temperature at which said carbonyl-substituted hydroxybenzene and said dialkyl sulfate form a substantially homogeneous liquid medium and said sodium carbonate is suspended in said medium,

c. maintaining said mixture at a temperature at least equal to said fluidizing temperature,

d. stirring said mixture thereby to promote an alkylation reaction in said mixture and produce a carbonyl substituted alkoxybenzene from said hydroxybenzene, and

e. adding lubricating water to said mixture during said alkylation reaction in amount just sufficient to maintain said mixture stirrable during said reaction.

4,065,505

OXIDATION PROCESS

Leo Kim; Timm E. Paxson, and Sunny C. Tang, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 5, 1976, Ser. No. 739,155

Int. Cl.² C07C *45/00*

U.S. Cl. 260—600 R **7 Claims**

1. In the process of oxidizing meta-phenoxytoluene selectively to meta-phenoxybenzaldehyde using selenium dioxide in the presence of an inert organic solvent at a temperature between about 150° C and about 260° C and at a pressure from about 5 to about 300 psig the improvement which comprises carrying out the reaction in the presence of a drying agent selected from the group consisting of $MgSO_4$, $CaCl_2$, silicas, aluminas, alumina-silicates and molecular sieves.

4,065,506

CONTINUOUS PROCESS FOR REFINING GLYOXAL

Richard Wessendorf, Essen-Heisingen; August Sommer, Herne, and Heinrich Birkelbach, Oer-Erkenschwick, all of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Filed Apr. 30, 1975, Ser. No. 573,197

Claims priority, application Germany, June 11, 1974, 2428081

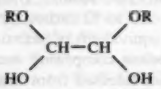
Int. Cl.² C07C *47/02*

U.S. Cl. 260—601 R **7 Claims**

1. A process for refining a crude glyoxal solution, especially one obtained by oxidation of acetaldehyde with nitric acid, containing volatile and non-volatile acids which consists essentially of:

A. Distillatively freeing the crude glyoxal solution of volatile acids, and neutralizing the resultant solution by addition of a basic agent at a temperature below 20° C;

B. Contacting the glyoxal with an alcohol having 1 to 3 carbon atoms whereby to form a glyoxal semiacetal of the formula



wherein R is C_1–C_3 alkyl;

C. Continuously extracting said glyoxal semiacetal with an organic solvent selected from the group consisting of benzene-benzine mixture, methylene chloride, ethylene chloride, carbon tetrachloride, toluene, ethylbenzene and cyclohexane which is immiscible with water;

D. Thereafter hydrolyzing the extracted glyoxal semiacetal by contacting the same with water.

4,065,507

PREPARATION OF METHACRYLIC DERIVATIVES FROM TERTIARY BUTYL-CONTAINING COMPOUNDS

Harley F. Hardman, Lyndhurst; James L. Callahan, Wooster, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Aug. 2, 1976, Ser. No. 711,014

Int. Cl.² C07C *45/16*

U.S. Cl. 260—604 R **5 Claims**

1. A process for producing methacrolein by the oxidation of a tertiary butyl-containing compound selected from the group consisting of tertiary-butyl alcohol, alkyl tertiary-butyl ether wherein the alkyl group contains from 1 to 4 carbon atoms, isobutylene dimer, isobutylene trimer and mixtures of isobutylene dimer and/or isobutylene trimer with isobutylene, in the presence of molecular oxygen and optionally in the presence of steam, at a temperature in the range of from about 200° to 600° C, and in the presence of a catalyst having the formula:

$$A_a C_c Fe_e Bi_f D_d Mo_g O_x$$

wherein

A is an alkali metal, barium, strontium, thallium, indium, silver, copper, or mixtures thereof;

C is nickel, cobalt, magesium, zinc, manganese, cadmium, calcium, or mixtures thereof;

D is phosphorus, antimony, germanium, chromium, thorium, tin, niobium, praseodymium, tungsten, boron, zirconium, cerium, arsenic or mixtures thereof; and

wherein

a is a number from 0 to 3;

c is a number from 0.001 to 12;

d is a number from 0 to 3;

e and *f* are each a number from 0.01 to 12;

g is 12; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present.

4,065,508

POLYPHENOXY ALKANES

Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

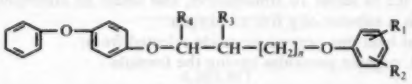
Filed May 14, 1975, Ser. No. 577,241

Claims priority, application Switzerland, Mar. 26, 1975, 3969/75

Int. Cl.² C07C *43/22*

U.S. Cl. 260—613 R **10 Claims**

1. A compound of the formula



(I)

wherein

n represents the number 0, 1 or 2,

R_1 represents hydrogen, C_1-C_4-alkyl, C_1-C_2-alkoxy, C_3-C_4-alkenyloxy, C_3-C_5-alkynyloxy, or halogen,

R_2 represents hydrogen, C_1-C_3-alkyl, C_1-C_2-alkoxy or chlorine,

R_3 represents hydrogen, methyl ethyl or phenyl,

R_4 represents hydrogen or methyl.

4,065,509

SYNTHESIS OF β-METHYL DERIVATIVES OF 2,4-DICARBA-CLOSO-HEPTABORANE-7

Jerome F. Ditter, Santa Ana, and Eugene B. Klusmann, Irvine, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,893
Int. Cl.² C07F 5/02
U.S. Cl. 260—606.5 B **6 Claims**

1. A method for B-methylating 2,4-dicarba-closo-heptaborane which comprises:

admixing 2,4-dicarba-closo-heptaborane with methyl chloride in the presence of a metal trichloride in a trichloride-heptaborane mole ratio from 0.3:1 to about 5:1 in a reaction vessel;

heating said reaction mixture to a temperature from about 30° to about 60° C;

maintaining a pressure in said reaction vessel of at least 50 psig.

4,065,510

PRODUCTION OF AN ALKENOL FROM AN ALKENE OXIDE

Gerd Schreyer; Herbert Tanner, both of Grossauheim; Wolfgang Weigert, Offenbach, and Ullrich Gora, Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Division of Ser. No. 193,691, Oct. 29, 1971, abandoned. This application Dec. 12, 1975, Ser. No. 640,210
Claims priority, application Germany, Nov. 3, 1970, 2053915
Int. Cl.² C07C 29/00
U.S. Cl. 260—632 B **3 Claims**

1. In a process for the production of an alkenol from an alkene oxide at elevated temperature in the presence of a lithium phosphate catalyst the improvement comprising employing as the catalyst a lithium phosphate catalyst prepared by the process consisting essentially of coating molded, uniform, spherical particles of an inert carrier with particles of lithium phosphate in the presence of about 0.5 to 4 parts of moisture per part of lithium phosphate at a temperature from 10° to 130° C to produce a catalyst consisting essentially of molded, uniform, spherical particles of an inert carrier having an outer cohesive coating of the lithium phosphate.

4,065,511

ALCOHOL PRODUCTION

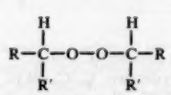
Hans D. Holtz, Bartlesville, Okla., assignor to Phillips Petroleum, Bartlesville, Okla.

Continuation-in-part of Ser. No. 315,824, Dec. 18, 1972, abandoned. This application Sept. 21, 1973, Ser. No. 399,491
Int. Cl.² C07C 29/00, 121/34, 67/00
U.S. Cl. 260—635 R **14 Claims**

1. A process for preparing alcohols substantially free of ethers which comprises contacting at a temperature in the range of from about 0° C to 100° C, a pressure in the range from 0.5 to about 10 atmospheres, and under an atmosphere which is substantially free of oxygen:

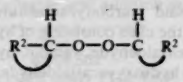
a. at least one organic peroxide selected from:

I. organic peroxides having the formula



wherein R and R′ are hydrocarbyl groups selected from alkyl, cycloalkyl, and aryl groups having from 1–12 carbon atoms,

II. organic peroxides having the formula



wherein R^2 is an alkylene group having 3–9 carbon atoms,

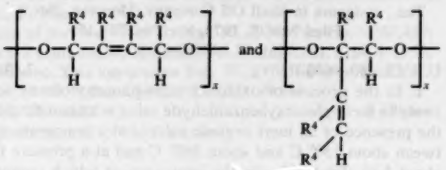
III. organic peroxides having the formula

wherein R^3 is a hydrocarbyl group having from 3–10 carbon atoms,

IV. endoperoxides, and

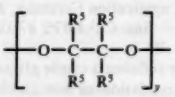
V. polyperoxides derived from the free radical polymerization of olefinically unsaturated monomers in the presence of oxygen and wherein the olefinically unsaturated monomer is

1. a conjugated diene and the polyperoxide has repeating units of the formulas



wherein x is an integer from 2 to 200 and R^4 is hydrogen or a hydrocarbyl group selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, and alkaryl groups having 2–20 carbon atoms, or

2. olefins conjugated with other functional groups selected from cyano, aryl, aryloxycarbonyl, and alkyloxycarbonyl groups and the polyperoxide has repeating units of the formula



wherein y is an integer from 2–200 and R^5 is selected from hydrogen, alkyl, cycloalkyl, aryl, alkaryl, cyano, aryloxycarbonyl, and alkyloxycarbonyl groups with the proviso that at least one R^5 must be cyano, aryl, aryloxycarbonyl, alkyloxycarbonyl, or other functional group conjugated with the olefin prior to formation of the polyperoxide, with

b. a trihydrocarbylphosphine wherein the hydrocarbyl group has from 1 to 12 carbon atoms, the molar ratio of phosphine to equivalents of peroxide being at least 1, and

c. a reaction medium comprising water and a water-soluble organic solvent selected from lower alkanones, tetrahydrofuran, and 1,4-dioxane also capable of solubilizing the phosphine and peroxide, the amount of water present being at least one mole of water per equivalent of peroxide which is sufficient to insure that no ether by-product is formed but the amount of water should not exceed the amount which will cause the reaction medium to separate into two phases.

4,065,512

ISO-C_4 COMPOUND REACTIONS WITH PERFLUOROSULFONIC ACID RESIN CATALYSTS

William R. Cares, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed July 6, 1976, Ser. No. 702,948
Int. Cl.[2] C07C *29/04;* B01J *27/02*
U.S. Cl. 260—641 9 Claims

1. A process for producing t-butanol comprising contacting isobutene and water with a membrane of a perfluorosulfonic acid resin which is the copolymer of sulfonyl fluorovinyl ether and a fluorocarbon at a temperature in the range of about 0° to 150° C, said membrane separating said isobutene and water and recovering a product containing t-butanol.

4,065,513

PROCESS FOR REMOVING ACETYLENE FROM HYDROGEN CHLORIDE GAS

Richard H. Miller, Sulphur, La., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 15, 1976, Ser. No. 677,465
Int. Cl.[2] C01B *7/08;* C07C *21/06*
U.S. Cl. 260—656 R 9 Claims

1. In the thermal dehydrochlorination of dichloroethane to form (1) vinyl chloride and (2) by-product hydrogen chloride substantially free of elemental chlorine wherein said by-product hydrogen chloride contains at least 200 parts per million by weight of acetylene, the improvement which comprises purifying said by-product hydrogen chloride by contacting a vaporous stream of said hydrogen chloride with activated carbon in a reaction zone free of catalytically effective amounts of acetylene hydrochlorination catalyst and added elemental chlorine at a temperature of at least 190.6° C. for a time sufficient to reduce by hydrochlorination the acetylene content thereof below 50 parts per million by weight.

4,065,514

PREPARATION OF METHANE

Burton H. Bartley, Fishkill, and John H. Estes, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 272,528, July 17, 1972, abandoned. This application Nov. 28, 1975, Ser. No. 636,237
Int. Cl.[2] C07C *9/02*
U.S. Cl. 260—676 R 12 Claims

1. The process for preparing methane by conversion of a hydrocarbon containing at least two carbon atoms which comprises contacting in a conversion zone a mixture consisting essentially of hydrogen and said hydrocarbon with a finely-divided, high surface area catalyst consisting essentially of (a) 0.01%-99.9% of total catalytic metal content of a metal of the platinum-palladium group and (b) 0.01%-99.9% of total catalytic metal content of a metal of the iron group, said iron-group metal and said platinum-palladium group metal, each being substantially distributed throughout the body of said finely divided, high surface area catalyst; maintaining said mixture in contact with said catalyst at methane-preparing conditions including temperature of 300°-800° C, and withdrawing effluent gas containing product methane in amount more than 50% by weight from said conversion zone.

4,065,515

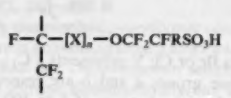
ALKANE ISOMERIZATION PROCESS USING A SUPPORTED PERFLUORINATED POLYMER CATALYST

James D. McClure, and Stanley G. Brandenberger, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 663,956, March 4, 1976, Pat. No. 4,038,213. This application Apr. 1, 1977, Ser. No. 783,523
Int. Cl.[2] C07C *5/30*
U.S. Cl. 260—683.68 8 Claims

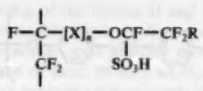
1. An isomerization process which comprises contacting a C_4 to C_8 normal paraffin feedstock at a reaction temperature of between about 125° and about 225° C in the presence of a catalyst composition comprising a solid, perfluorinated polymer catalyst supported on an inert porous carrier having an average pore diameter of between about 50 A and about 600 A in a weight ratio of catalyst to support of between about 0.1:100 and about 20:100 wherein said catalyst contains a repeating structure selected from the group of:

a)



or

b)



where *n* is 0, 1 or 2; R is a radical selected from the group consisting of fluorine and perfluoroalkyl radicals having from 1 to 10 carbon atoms; and X is selected from the group consisting of:

, $[O(CF_2)_m]$, $[OCF_2CFY]$ or $[OCFYCF_2]$

where *m* is an integer from 2 to 10 and Y is a radical selected from the class consisting of fluorine and the trifluoromethyl radical.

4,065,516

COMBINATION ISOMERIZATION-ALKYLATION PROCESS

John F. Moser, Jr., and William C. Behrmann, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 19, 1975, Ser. No. 642,538
Int. Cl.[2] C07C *3/54*
U.S. Cl. 260—683.47 8 Claims

1. In an alkylation process which comprises contacting a feed containing linear pentene-1 and linear pentene-2 with a paraffin at alkylation conditions in the presence of a catalyst comprising a strong acid selected from the group consisting of halosulfuric acid, trihalomethanesulfonic acid and mixtures thereof, the improvement which comprises (1) contacting said feed with an isomerization catalyst at isomerization conditions to convert at least a portion of said pentene-2 to pentene-1 prior to subjecting said feed to alkylation conditions and (2) recovering an alkylate of enhanced octane number relative to the alkylate obtained in the absence of the isomerization step (1).

4,065,517

FLAME RETARDANT POLYSULFONE COMPOSITION

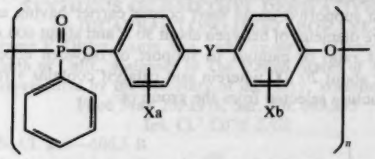
Naotake Okada, and Takeshi Iwabuchi, both of Ichihara, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Apr. 14, 1976, Ser. No. 676,870
Int. Cl.[2] C08K *5/53*
U.S. Cl. 260—823 3 Claims

1. A polyphosphonate-polyarylenepolyether polysulfone composition which comprises:

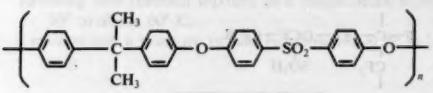
1 to 20 wt.% of a polyphosphonate having the formula:

(I)

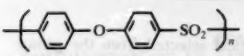


wherein X represents Br or Cl; Y represents a C_{1-5} alkylidene group or sulfone group; *a* and *b* are respectively integers of 1 to 4 and *n* is an integer of 2 to 100; and a polyarylenepolyether polysulfone of the formula:

(II)

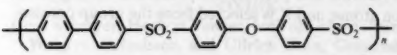


(III)



or

(IV)



wherein *n* is an integer of 10 to 200; or a mixture thereof.

4,065,518

POWDER PAINT BLEND OF EPOXY AND AMIDE-FUNCTIONAL COPOLYMER AND ANHYDRIDE-FUNCTIONAL COPOLYMER

Santokh S. Labana, Dearborn Heights, and Ares N. Theodore, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 426,164, Dec. 19, 1973, Pat. No. 3,959,405. This application Feb. 18, 1976, Ser. No. 659,175

The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.

Int. Cl.[2] C08L *63/10*

U.S. Cl. 260—836 **2 Claims**

1. In a thermosettable powder paint which exclusive of pigments, catalysts, antistatic agents, and plasticizers, the same being conventional non-reactive additives to a thermosettable powder paint, consists essentially of a coreactable particulate mixture of

A. an epoxy-functional copolymer of monoethylenically unsaturated monomers consisting essentially of about 5 to about 20 weight percent of a glycidyl ester of a monoethylenically unsaturated carboxylic acid and about 80 to about 95 weight percent of other monoethylenically unsaturated monomers, and having a glass transition temperature in the range of about 50° C. to about 90° C. and a molecular weight in the range of about 1500 to about 15,000,

B. as crosslinking agent, an anhydridefunctional copolymer,

C. 0.05 to about 4 weight percent of a non-reactive polymeric flow control agent based on the weight of said coreactable particulate mixture,

the improvement wherein:

1. said epoxy-functional copolymer is qualitatively difunctional and said other monoethylenically unsaturated monomers consist essentially of difunctional monomers selected from the group consisting of acrylamide and methacrylamide in an amount comprising about 2 to about 10 weight percent of said copolymer and monoethylenically unsaturated monomers consisting essentially of monofunctional monomers selected from the group consisting of esters of a $C_1 - C_8$ monohydric alcohol and acrylic acid, esters of a $C_1 - C_8$ monohydric alcohol and methacrylic acid and $C_8 - C_{12}$ monovinyl hydrocarbons, and

2. said anhydride-functional copolymer has molecular weight in the range of about 1500 to about 15,000 and is a copolymer of about 5 to about 20, weight percent of an anhydride of an olefinically unsaturated dicarboxylic acid and about 80 to about 95 weight percent of alpha-beta, monoethylenically unsaturated, quantitatively and qualitatively monofunctional monomers selected from the group consisting of esters of a $C_1 - C_8$ monohydric alcohol and a monocarboxylic acid selected from acrylic acid and methacrylic acid and $C_8 - C_{12}$ monovinyl hydrocarbons, said esters of a $C_1 - C_8$ monohydric alcohol and a monocarboxylic acid comprising in excess of 50 weight percent of said anhydride-function copolymer, and is present in said coreactive particulate mixture in an amount that provides about 0.4 to about 1.4 anhydride groups per functional group on said epoxy-functional copolymer.

4,065,519

PROCESS FOR COATING FINE POWDERS WITH A NYLON AND PRODUCTS MADE THEREWITH

Robert B. Koch, Reading, Pa., assignor to Rilsan Corporation, Glen Rock, N.J.

Division of Ser. No. 593,108, July 3, 1975, which is a continuation-in-part of Ser. No. 509,008, Sept. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 435,944, Jan. 23, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,644

Int. Cl.[2] C08L *77/00*

U.S. Cl. 260—857 TW **25 Claims**

1. A method of making a shaped structure composed of a nylon binder and a material in particle form, substantially each individual particle of the material being surrounded by the binder to form a coated powder, the shaped structure having substantially no particle to particle contact and having distribution of the nylon binder substantially uniform throughout, comprising:

A. charging into a forming apparatus the coated powder of the material particles coated with the nylon, the nylon being one which adheres to the individual material particles and is capable of being drawn into a filament or fiber and being a polyamide wherein the recurring amide groups are separated from each other by an alkylene radical having from 3 to 12 contiguous carbon atoms,

1. the coated powder being substantially in the form of agglomerates of individually coated particles of the material,

2. the coated powder comprising individual particles of the material having a size from about 1 millimicron to about 500 microns and having a substantially uniform coating of nylon, the material particles being insoluble in solvents which dissolve the nylon, the nylon coating representing at least 2% based on the weight of the coated powder;

B. compressing the coated powder in the forming apparatus at a pressure of about 200 – 100,000 psi to bind and form the coated particles into the shaped structure; and

C. recovering the shaped structure from the forming apparatus.

4,065,520

GRADIENT POLYMERS OF TWO OR MORE ALPHA MONO-OLEFINIC MONOMERS CAPABLE OF POLYMERIZING WITH THEMSELVES AND EACH OTHER

Frederick Eugene Bailey; Werner Claus von Dohlen, both of Charleston, W. Va.; Markus Matzner, Edison, N.J.; Robert Hayward Young, Somerville, N.J., and Lloyd Mahlon Robeson, Whitehouse Station, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 4, 1976, Ser. No. 692,923
Int. Cl.[2] C08F *10/00, 297/08*
U.S. Cl. 260—878 B 20 Claims

1. Polymer of at least two different olefinic monomers capable of polymerizing with themselves and each other, said polymer comprising a plurality of polymer chains along which the proportion of mer units provided by a first said monomer for a given first chain length gradually increases as the proportion of mer units provided by a second said monomer along said first chain length gradually decreases to a second chain length along which the proportion of mer units provided by said first and second monomers, respectively, remain substantially constant throughout said second chain length.

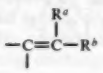
4,065,521

ACRYLATE-BUTADIENE GRAFT COPOLYMERS AND REINFORCED PLASTIC COMPOSITIONS CONTAINING SUCH COPOLYMERS

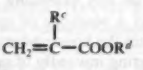
Donald R. Lachowicz, Fishkill, and Charles B. Holder, Wappinger Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 335,858, Feb. 26, 1973, abandoned, and a continuation-in-part of Ser. No. 335,857, Feb. 26, 1973, abandoned. This application Nov. 22, 1974, Ser. No. 526,200
Int. Cl.[2] C08L *9/00, 23/00*
U.S. Cl. 260—879 1 Claim

1. A graft copolymer comprising a backbone polymer having a hydrocarbon chain portion and a plurality of pendant hydrocarbon groups each containing a moiety of the formula:



wherein R^a and R^b are independently selected from the group consisting of hydrogen and alkyl of from 1 to 16 inclusive carbon atoms, having graft thereon an acrylate of the formula:



wherein R^c is selected from the group consisting of hydrogen and alkyl of from 1 to 3 inclusive carbon atoms and R^d is alkyl of from 1 to 30 inclusive carbon atoms, to form a graft copolymer, wherein the said backbone polymer is 1,2-polybutadiene and wherein about 5 to about 80 percent by weight of the graft copolymer is 1,2-polybutadiene with the balance being the said acrylate.

4,065,522

IONIC SULFONATE-MODIFIED THERMOPLASTIC RESINS

Charles Louis Myers, Belpre, Ohio, and Michael Kent Rinehart, Parkersburg, W. Va., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 7, 1976, Ser. No. 720,534
Int. Cl.[2] C08L *51/04*
U.S. Cl. 260—880 R 4 Claims

1. A thermoplastic copolymer composition comprising: graft polymers containing from 5 to 95 wt.%, based on final polymer of at least one vinyl monomer selected from the group consisting of styrene, alphamethylstyrene vinyl toluene, acrylonitrile, methacrylonitrile, the lower alkyl esters of acrylic acid and the lower alkyl esters of methacrylic acid, and from 15 to 1 wt.% based on final polymer of a monomer selected from the group consisting of the Group II and Group III metal salt of a copolymerizable ethylenically-unsaturated sulfonic acid as grafting monomer, said grafting monomers copolymerized in the presence of from 95 to 5 wt.%, based on final polymer, of a rubbery substrate polymer selected from the group consisting of polybutadiene, styrenebutadiene copolymers containing up to 50% by weight styrene, and rubbery C_2–C_8 alkyl acrylate copolymers.

4,065,523

PROCESS FOR INCREASING MOLECULAR WEIGHT OF A POLYMER

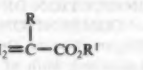
Thomas W. Hutton, Doylestown, and Pamela J. Rogers, North Wales, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 24, 1975, Ser. No. 634,816
Int. Cl.[2] C08L *31/02*
U.S. Cl. 260—885 12 Claims

1. A process for preparing an adhesive from copolymers A and B, the composition comprising:

(A) from about 5 to about 95 parts by weight of an addition copolymer having a Tg in the range of from 0° to −85° C. comprising:
   1. from about 85 to 99.5 parts by weight of a monomer or monomers selected from alkyl (C_2-18) or alkoxyalkyl acrylate and
   2. from about 0.5 to about 15 parts by weight of an ethylenically unsaturated amine, carboxylic acid, sulfonic acid, or mixtures thereof, with

B. from about 5 to about 95 parts by weight of an addition copolymer having a Tg in the range of from about 20° to 150° C. comprising:
   1. from about 85 to about 99.5 parts by weight of a monomer or monomers selected from a monomer of the formula:



wherein R is hydrogen or methyl and R^1 is lower alkyl, lower cycloalkyl or isobornyl and
   2. from about 0.5 to about 15 parts by weight of an ethylenically unsaturated amine, carboxylic acid or sulfonic acid or mixtures thereof, which comprises the steps of:
      a. polymerizing the monomers to form copolymer B by gradual addition, solution polymerization in an organic solvent at reflux in the presence of 0 to 5 parts of water per 100 parts of the monomers used to make copolymer B
      b. adding to copolymer B 0 to 5 parts of water per 100 parts of monomer to be added in step (c) and then
      c. adding to copolymer B the monomer mix which is to be polymerized to form copolymer A,
      d. and polymerizing the monomer mix added in step (c); at least 0.1 parts of water being present during the polymerization of one or both of copolymers A and B.

4,065,524

FILM-FORMING LIGHT-SENSITIVE POLYMERIC MATERIAL CARRYING AZIDOSULFONYL GROUPS

Urbain Leopold Laridon; Gerard Albert Delzenne, both of Wilrijk-Antwerp, Belgium; Helmut Mader, Leverkusen, Germany; Hans Ulrich, Leverkusen, Germany, and Bernhard Seidel, Cologne-Mulheim, Germany, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 463,851, June 14, 1965, abandoned. This application Mar. 17, 1975, Ser. No. 558,622

Claims priority, application United Kingdom, June 15, 1964, 24760/64

Int. Cl.[2] C08G *75/18, 75/30*

U.S. Cl. 260—895 12 Claims

1. A film-forming light-sensitive polymeric material consisting essentially of one or two polymers, which is soluble before exposure to actinic light in an organic solvent or water and which becomes insoluble in said organic solvent or water when exposed to actinic light and having carried on said polymer or polymers (A) azidosulphonyl groups, and (B) a component which is reactive with moieties obtained upon the photochemical decomposition of azidosulphonyl groups by exposure to actinic light, said reactive component being selected from the group consisting of a hydroxyl radical, pyridine, a phenyl radical, and pyrrolidone, said (A) and (B) each being present in said polymeric material in an amount sufficient to, upon exposure of said polymeric material to actinic light, photochemically cross-link and render said polymeric material insoluble in said organic solvent or water.

4,065,525

INHIBITION OF CRYSTALLIZATION OF O-ETHYL-O-(4-NITROPHENYL)-PHENYLPHOSPHONOTHIOATE

Ralph Forrest May, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 16, 1976, Ser. No. 723,956

Int. Cl.[2] C07F *9/40*

U.S. Cl. 260—989 9 Claims

1. A method of inhibiting crystallization of O-ethyl-O(4-nitrophenyl)-phenylphosphonothioate at temperatures in the range between (−) 6° C. and 25° C. comprising maintaining therein between about 6 and about 12% by weight of bis-(O-4-nitrophenyl)-phenylphosphonothioate.

4,065,526

FUEL INTRODUCTION DEVICE FOR INTERNAL COMBUSTION ENGINE

Robert Dixon Englert, Corona Del Mar, and Kenneth Ronald Armstrong, Lakewood, both of Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 660,608, Feb. 23, 1976, abandoned, which is a division of Ser. No. 384,166, July 30, 1973, abandoned. This application May 28, 1976, Ser. No. 691,168

Int. Cl.[2] F02M *9/02*

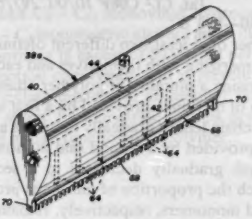
U.S. Cl. 261—62 1 Claim

1. In combination with an air-liquid induction device that includes an intake air duct having a converging portion, a variable area throat portion of rectangular cross-section through which a mixture of air and finely divided liquid is passed at sonic velocity and a fuel supply, a fuel dispensing and air flow shaping device including in combination:

a. an elongated distributor body positioned upstream of the throat and extending within said air duct in a direction parallel to the longer axis of the rectangular throat, said distributor body having upstream and downstream edges and being positioned at an intermediate location within said air duct to divide the flow of air into converging streams;

b. means forming a plurality of displaced fuel openings in said distributor body extending longitudinally therealong and terminating along the downstream edge thereof and adapted to discharge fuel therefrom in a plurality of coherent liquid streams;

c. means forming an internal passage within said distributor body and connected to said fuel supply communicating with the openings for the passage of liquid fuel; and



d. a wire means attached to the distributor body spaced from and adjacent said openings downstream thereof within the converging portion of the intake air duct, said wire means extending helically coiled along the entire length of said body transversely of the direction of air flow and effective to receive fuel from said openings for the fuel to spread along its length as a thin film so that such fuel may be stripped off by the converging air streams.

4,065,527

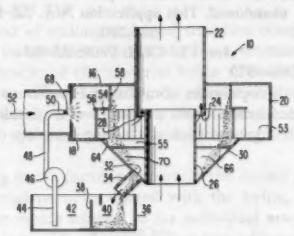
METHOD AND APPARATUS FOR INTERACTION OF GAS AND LIQUID

David A. Graber, 315 Haight St., Menlo Park, Calif. 94025

Filed Feb. 19, 1976, Ser. No. 659,292

Int. Cl.[2] B05B *7/10*

U.S. Cl. 261—79 A 22 Claims



1. Apparatus for creating an interaction between a gas and a liquid comprising: a housing having a gas inlet, a gas outlet and means defining a circular path of travel for a gas between the inlet and outlet, said housing further having a pair of vertically spaced members, the lower member having an annular portion defining a generally continuous inner periphery, there being structure coupled to and extending downwardly from said lower member, and a plurality of spaced vanes mounted in fixed positions within the housing between said members, each of said vanes projecting inwardly of said inner periphery of the lower member, said vanes being at acute angles relative to each other and arranged in a circular pattern in surrounding relationship to a central, liquid-receiving space in the housing, the central space communicating with the outlet, the spaces between the vanes defining fluid passages in flow communication with said central space and in fluid communication with said path and extending substantially along said path, there being means coupled with the housing for introducing a liquid there-

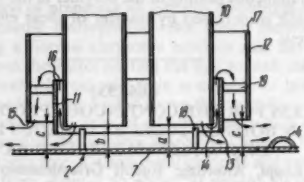
into, whereby a gas flowing through said fluid passages and into said central space will create a vortex action in the latter to cause a liquid therein to move upwardly with respect to said structure past said inner periphery and to enter said fluid passages to thereby form a penetrable liquid curtain extending across the fluid passages for contact with the gas as it flows from said path into said central space.

4,065,528

COLUMN APPARATUS FOR GAS-LIQUID HEAT AND MASS EXCHANGE PROCESSES

Ivan Petrovich Slobodyanik, ulitsa Gagarina, 87, kv. 15, Krasnodar, U.S.S.R.

Filed May 25, 1976, Ser. No. 690,041
Int. Cl.² B01F *3/04*
U.S. Cl. 261—114 R **5 Claims**



1. A column apparatus for gas-liquid heat and mass exchange processes, comprising: a casing; contact plates arranged in said casing one above another and each being constituted as a horizontal plate having a center solid portion and slots distributed over the rest of the plate area for the passage of gas therethrough; annular pocket forming means for collecting liquid flowing off said contact plates, fixed around said contact plates; discharge pipes for discharging liquid from each of said contact plates onto the contact plate therebelow; said discharge pipes having upper ends connected to said annular pocket forming means of said upper contact plate; said discharge plates having lower ends terminating slightly above said solid center portion of the lower contact plate; inner and outer spaced coaxial rings surrounding said lower ends of said discharge pipes, said rings being arranged in spaced relation above said solid center portion of the contact plate; said inner ring having a bottom edge extending below the level of the bottom edge of said discharge pipes and below the bottom edge of the outer ring, said inner ring having a top edge arranged above the level of said bottom edge of said discharge pipes and below the top edge of said outer ring, in such a manner that as the liquid is being discharged, there is formed a hydroseal.

4,065,529

PROCESS FOR SPHEROIDIZATION OF RDX CRYSTALS

Roger R. Lavertu, Ste-Foy, and Antonin Godbout, Charlesbourg, both of Canada, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 5, 1976, Ser. No. 646,838
Claims priority, application Canada, Jan. 13, 1975, 217770
Int. Cl.² C06B *21/00*
U.S. Cl. 264—3 E **8 Claims**

1. A method for the production of spheroids of cyclotrimethylenetrinitramine from angular crystals, comprising the steps of agitating angular crystals of cyclotrimethylenetrinitramine having a particle size of at least 70 microns in a cyclohexanone medium saturated with RDX at an initial temperature,

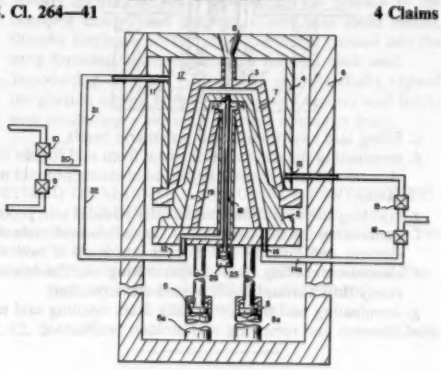
with heating of the solution, followed by separation of the crystals from the heated solution.

4,065,530

METHOD FOR MOLDING PRODUCTS FROM POLYMERIC MATERIAL

Paul R. Schaeffer, Paoli, Pa., assignor to The Alan I W Frank Corporation, Exton, Pa.

Filed May 17, 1976, Ser. No. 686,841
Int. Cl.² B29D *27/00*
U.S. Cl. 264—41 **4 Claims**



1. In a method for molding products in a mold cavity formed by a male and female mold element which method includes the steps of closing the mold elements to form the cavity, filling said cavity with polymeric beads, heating said mold elements and injecting steam into the cavity through the male mold element, the improvement in said method comprising:

a. introducing steam into spaces or channels in said mold elements during closing of said elements and permitting said steam to flow therethrough and heat said elements;
b. terminating the discharge of steam from the female element while commencing the filling of the mold cavity with said polymeric beads;
c. continuing the flow of steam through said male element and terminating the discharge of steam from the male element not later than the injection of steam into the mold cavity; and
d. terminating the flow of steam to both of said elements after said injection of steam.

4,065,531

METHOD FOR MOLDING PRODUCTS FROM PARTICULATE POLYMERIC MATERIAL

Paul R. Schaeffer, Paoli, Pa., assignor to The Alan I W Frank Corporation, Exton, Pa.

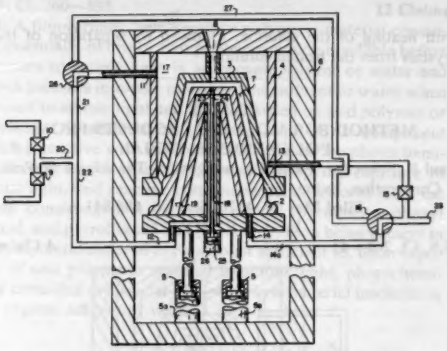
Filed May 17, 1976, Ser. No. 686,982
Int. Cl.² B29D *27/00*
U.S. Cl. 264—41 **4 Claims**

1. In a method for molding products in a mold cavity formed

by a male and female mold element which method includes the steps of closing the mold elements to form the cavity, heating said elements, filling said cavity with polymeric beads, injecting steam into the cavity and cooling said elements, the improvement in said method comprising:

a. simultaneously introducing steam into both of said mold elements through spaces or channels therein while closing said elements to form said cavity;

b. terminating the direct introduction of steam into said female mold element during mold element closing when steam begins to discharge from said male mold element and directing the steam discharged from said male mold element into the female mold element;



c. filling said cavity with said polymeric beads;

d. terminating the discharge of steam from said female mold element not later than the injection of steam into said mold cavity;

e. injecting steam into the mold cavity to mold said product;

f. terminating the introduction of steam into said male mold element and directly introducing into each of said mold elements a cooling fluid and permitting said fluid to separately flow through each of said elements; and

g. terminating said flow of cooling fluid, opening said mold elements and removing said molded product.

4,065,532

PROCESS FOR THE ADMIXTURE OF ADDITIVES INTO PLASTICS WITH SIMULTANEOUS REMOVAL OF VOLATILE CONSTITUENTS

Hans Wild, Frankenthal; Guenter Jeckel, Landau; Adolf Echte, Ludwigshafen; Johann Zizlsperger, Schriesheim; Rudi Wilhelm Reffert, Beindersheim, and Gunter Thielen, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 3, 1975, Ser. No. 564,618

Claims priority, application Germany, Apr. 11, 1974, 2417792; Feb. 19, 1975, 2507061; Mar. 6, 1975, 2509744

Int. Cl.[2] B29B *1/04, 1/10*

U.S. Cl. 264—68 **9 Claims**

1. In a process for the admixture of additives to thermoplastically processable polymers containing volatile constituents, with simultaneous removal of the volatile constituents, through separately feeding additives and a polymer melt, solution or dispersion into a horizontal devolatilizing screw extruder, and then heating, mixing and conveying the charge whilst vaporizing the volatile constituents, and finally extruding the mixture, the improved steps taken in sequence in the direction of flow along the extruder which comprise:

first introducing the additives downwardly into the extruder from above;

then introducing the polymer in a liquid form as said melt, solution or dispersion, preheated to a temperature of from 150° to 250° C, upwardly into the extruder from below under a pressure which corresponds at least to the vapor pressure of the volatile constituents at the temperature concerned, thereby immediately vaporizing said volatile constituents;

simultaneously withdrawing at least 50 percent of the volatile constituents upwardly from the extruder at an orifice located approximately vertically above the point at which the polymer is being introduced from below; and

advancing the polymer forwardly from its point of introduction under shear by the screw so that the cooling of the polymer due to said vaporization is compensated by the simultaneous heating of the polymer in the screw extruder which is increased by transfer of shear energy from the screw.

4,065,533

PROCESS FOR THE CONTINUOUS PRODUCTION OF SILICON RODS OR TUBES BY GASEOUS DEPOSITION INTO A FLEXIBLE WOUND BAND

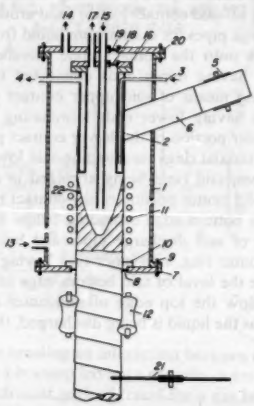
Franz Koppl, Altotting; Rudolf Griesshammer, and Helmut Hamster, both of Burghausen, all of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik Grundstoffe mbH, Burghausen, Germany

Filed Mar. 9, 1977, Ser. No. 776,025

Claims priority, application Germany, Apr. 27, 1976, 2618398

Int. Cl.[2] B01J *8/00;* **C01B** *33/02*

U.S. Cl. 264—81 **9 Claims**



1. A process for the continuous production of silicon rods or tubes by the deposition of silicon from a gaseous mixture on the inner wall of a carrier tube heated to the deposition temperature, which comprises the steps of

a. cooling a hollow metal cylinder having one open end in a reactor;

b. continuously winding around the hollow metal cylinder a flexible band substantially resistant to silicon at the deposition temperature, in an overlapping manner and at an angle of pitch from 5° to 40°, so as to form a carrier tube for the silicon to be deposited;

c. continuously drawing the tube off the metal cylinder by a rotary traction movement and heating the portion of the

tube adjacent the metal cylinder and still in the reactor to the deposition temperature of about 1,050° to 1,250° C;

d. at the same time passing said gas mixture for decomposition through the tube under a pressure exceeding the external atmospheric pressure by 0.01 to 1 bar, thus causing the inside of the tube gradually to be filled at least partly with silicon as the decomposition of the gas mixture proceeds; and

e. continuously withdrawing the Si-filled tube from the reactor at the open end thereof and obtaining the silicon rod or tube by the removal of the carrier tube.

4,065,534

METHOD OF PROVIDING A RESIN REINFORCED ASBESTOS DIAPHRAGM

Thomas A. Rechlicz, and Bernard A. Maloney, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 20, 1976, Ser. No. 678,561
Int. Cl.² C25B *13/06*
U.S. Cl. 264—91 **5 Claims**

1. In a method of preparing an asbestos diaphragm containing a thermoplastic hydrophobic resin which method comprises forming a fibrous chrysotile asbestos mat having the resin therein and thereafter heating the mat to melt said resin, the improvement wherein said resin is capable of being oxidized and degraded when heated above the crystalline melting point thereof in the presence of asbestos, and which method comprises depositing said asbestos diaphragm from an aqueous slurry substantially free of alkali metal chloride and consisting essentially of from about 1 to about 30 weight alkali metal hydroxide and from about 0.1 to about 10 weight percent total asbestos and resin, wherein the resin is from about 0.2 to about 8 weight percent of the total asbestos and resin and wherein the resin is selected from the group consisting of:

A. hydrocarbon resins;

B. homopolymers having the empirical formula:

$$[CY^{I}Y^{II}-CY^{III}Y^{IV}]$$

and

C. copolymers having hydrocarbon and halocarbon moieties wherein the halocarbon moiety is chosen from the group consisting of halocarbons having the empirical formula:

$$[CX^{I}X^{II}-CX^{III}X^{IV}]$$

wherein at least 20 percent of the copolymer is the hydrocarbon moiety;

where Y^{I} is halogen chosen from the group consisting of fluorine, chlorine, and bromine, Y^{II}, Y^{III}, and Y^{IV} are chosen from the group consisting of fluorine, chlorine, bromine, and hydrogen, and at least one of said Y^{II}, Y^{III}, and Y^{IV} is hydrogen, and where X^{I} is a halogen chosen from the group consisting of fluorine, chlorine, and bromine, and X^{II}, X^{III}, and X^{IV} are chosen from the group consisting of fluorine, chlorine, bromine, and hydrogen.

4,065,535

THREAD FORMING AND NECK FINISHING PROCESS

Richard Webster Legrand, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 27, 1976, Ser. No. 754,203
Int. Cl.² B29C *17/07*
U.S. Cl. 264—94 **3 Claims**

1. A process for biaxially blow molding hollow plastic articles to provide a finished neck of axially oriented material comprising:

a. heating a parison of partially crystalline orientable material to just below the material's crystalline melting point;

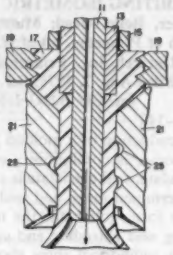
b. placing one end of said parison over a blow pin;

c. clamping said one end of said parison over and radially spaced from said blow pin;

d. axially stretching and orienting said parison, thereby drawing said one end of said parison down against said blow pin and reducing the thickness of said parison to a first wall thickness over said blow pin;

e. further stretching the free portion of said parison to a second wall thickness, said second wall thickness being thinner than said first wall thickness;

f. clamping mold means around said parison, said mold means having neck finishing cavities contained therein in the portion of said mold means surrounding said blow pin;



g. axially moving an inner portion of the parison in the clamped end of said parison toward said mold means, thereby forcing a portion of said oriented parison into the neck finishing cavities forming a finished neck; and

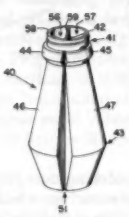
h. introducing blow air via the blow pin to radially expand the portion of said parison having said second wall thickness producing a biaxially oriented container body.

4,065,536

METHOD OF MAKING A PRECISELY PARTITIONED BULBOUS-SHAPE CONTAINER

Malcolm Bramel Lucas, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 493,308, July 31, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,105
Int. Cl.² B29C *17/07*
U.S. Cl. 264—98 **1 Claim**



1. A method of making a bulbous-shape open-top container of unitary construction of thermoplastic material which container is precisely partitioned by a longitudinally extending internal bulkhead of predetermined size, shape and orientation, said method comprising:

providing a longitudinally partitioned preform of said thermoplastic material which preform comprises a tubular exterior wall and said internal bulkhead, said step of providing a preform comprising cutting a predetermined length from an endless longitudinally partitioned tubular extrusion comprising said tubular exterior wall and an integral longitudinally extending said internal bulkhead;

heating the body of said preform to a sufficiently high temperature equal to or greater than the thermoplastic temperature of said thermoplastic material to enable pinching one end of said preform closed and to enable blow molding said exterior wall to said bulbous-shape of said container;

pinching said one end of said preform closed prior to said blow molding; and

converting said preform into said container by blow molding said exterior wall of said preform to said bulbous-shape while constraining said bulkhead along its faces and edges, during said heating, said pinching, and said blow molding, to virtually obviate changing its size, shape, or orientation during said blow molding.

4,065,537

PROCESS FOR PRODUCING MOLDED GOLF BALLS EXHIBITING ISOMETRIC COMPRESSION

Richard Miller, Belle Mead; Murray H. Reich, and Emma Kuntz, both of Princeton, all of N.J., assignors to Princeton Chemical Research, Inc., Princeton, N.J.

Filed Aug. 7, 1975, Ser. No. 602,959
Int. Cl.[2] B29G *1/00, 7/00*
U.S. Cl. 264—143 **9 Claims**

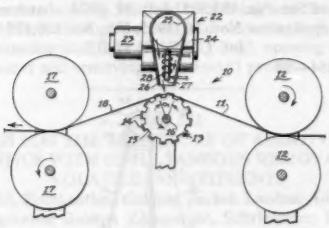
1. In the production of a molded golf ball wherein a cross-linkable elastomer is continuously extruded through a die to form an extrudate, said extrudate is cut into slugs of the appropriate predetermined mass, and said slugs are molded in golf ball molds to form golf balls, the improvement which comprises forming said extrudate and cutting it so as to produce approximately cylindrical slugs about 2.5 to 3.3 inches long and having substantially flat or convex top and bottom surfaces, whereby the resulting golf balls are isometric.

4,065,538

PROCESS FOR REDUCING DUST IN FIBRILLATED YARN

Kenneth C. Gustafson, Chattanooga, Tenn., and Edward L. Chastain, Lafayette, Ga., assignors to Fibron, Inc., Chattanooga, Tenn.

Filed Sept. 26, 1975, Ser. No. 616,939
Int. Cl.[2] B29C *17/12, 17/00*
U.S. Cl. 264—154 **10 Claims**



1. A process for reducing dust particles in a fibrillated tape yarn of synthetic material in which said dust particles are formed in the fibrillation of said tape yarn, comprising the steps of:

a. relatively moving fibrillated tape yarn of synthetic material past a heating station,

b. applying a critical amount of heat to said tape yarn at said heating station sufficient to fuse only said dust particles into said tape yarn,

c. said critical amount of heat being sufficient to melt said dust particles but insufficient to melt or damage said tape yarn.

4,065,539

METHOD OF MOLDING PLASTIC CONTAINERS

Murray Nadel, 433 Beechmont Drive, New Rochelle, N.Y. 10804

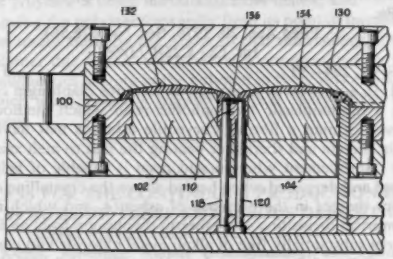
Continuation-in-part of Ser. No. 518,955, Oct. 29, 1974, abandoned. This application Feb. 2, 1976, Ser. No. 654,658
Int. Cl.[2] B29D *3/00*
U.S. Cl. 264—251 **6 Claims**

1. The method of making a hinged, molded plastic compact in equipment employing cooperable, cavity-defining dies wherein one die has an inlet port for introducing molten plastic into the cavity and wherein another die has a supporting surface and a recess adjacent the same, comprising the steps of:

a. disposing a hinge part having two anchorage portions and a connecting pintle portion so that all said portions rest on said supporting surface while the dies are separated, with the pintle portion disposed in and engaged with the walls of said die recess,

b. bringing the dies together to locate portions of the die cavities adjacent one of said hinge anchorage portions, and to cause other portions of the dies to engage and closely confine the other of said anchorage portions and also said pintle portion so as to prevent the same from being surrounded and engaged by the molten plastic,

c. injecting molten plastic through the port and into the die cavities, and also into engagement with and around said



one hinge part anchorage portion to embed the same and hold the hinge part captive.

d. cooling the plastic to solidify it,

e. separating the dies from one another,

f. removing the solidified molded plastic and captive hinge part as a unitary assemblage from one of the die halves,

g. placing the assemblage comprising the solidified plastic and hinge part in another set of dies defining a cavity such that the other of the anchorage portions of the hinge part extends into a part of the defined cavity,

h. injecting molten plastic into the defined cavity whereby it flows around and embeds said other anchorage portion of the hinge part,

i. cooling the plastic to solidify it, and

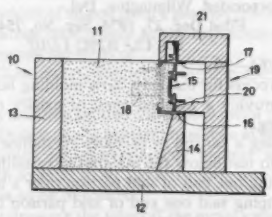
j. removing the solidified plastic and said assemblage from said other dies.

4,065,540

METHOD OF PRODUCING PRECAST CONCRETE PANELS WITH BUILT-IN OUTER SASH FRAMES

Eiryo Okami, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Oct. 17, 1975, Ser. No. 623,558
Claims priority, application Japan, Oct. 19, 1974, 49-120636
Int. Cl.[2] B28B *1/14*
U.S. Cl. 264—278 **1 Claim**



1. A method of producing a precast concrete panel with a

built-in outer frame of a sash window or the like, wherein the outer sash frame has lowermost and uppermost flanges, said method comprising the steps of:

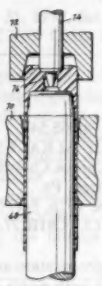
a. providing a form which has a bottom, side panels on said bottom for defining the outer periphery of the concrete panel, and raised rectangular sill-defining rest means arranged internally of the side panels on the bottom for defining the inner periphery of the concrete panel;
b. arranging a plurality of clamping fixtures in spaced positions on the inside of the rest means, each fixture including lower and upper holders arranged to face the raised rest means for downwardly clamping the lowermost and uppermost flanges, respectively;
c. placing the outer sash frame with the lowermost flange to rest on the top of the rest means in spaced relation to the bottom of the form;
d. clamping the outer sash frame downwardly onto the rest means by means of the lower and upper holders acting downwardly and independently of each other on the sash frame flanges remotely from its corners;
e. pouring concrete into a space bounded by the outer sash frame and the bottom, side panels and rest means of the form;
f. curing the concrete; and
g. after releasing the clamping fixtures, withdrawing the precast concrete panel with the built-in outer sash frame from the form.

4,065,541

METHOD OF MAKING PLASTIC CARTRIDGE CASING

George R. Eckstein, Fairfield, and William G. Moyher, Stratford, both of Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Division of Ser. No. 374,336, June 28, 1973, Pat. No. 3,855,381, which is a division of Ser. No. 199,913. Nov. 18, 1974, Pat. No. 3,786,755. This application May 17, 1974, Ser. No. 470,757
Int. Cl.[2] B29F *5/00*
U.S. Cl. 264—295 **1 Claim**



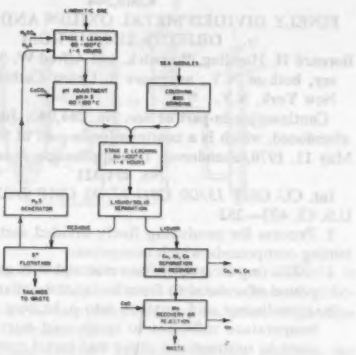
1. A method of making a primer seal for a plastic shotgun shell comprising forming of a tubular plastic body having an integral transverse base portion with a longitudinally extending primer opening therein, extruding a collar of plastic around the primer opening which projects rearwardly from the rear face of the base portion to establish a volume of plastic at the correct radial distance from the axis of the shell, forcing said plastic collar forwardly so as to position the plastic material of said collar inside said primer opening so as to form a continuous, annular gas sealing ring of oriented plastic which is integral with and has a smaller diameter than the remaining side wall of the primer opening.

4,065,542

TWO STAGE LEACHING OF LIMONITIC ORE AND SEA NODULES

Kohur Nagaraja Subramanian, Mississauga, and Gerald Vernon Glaum, Oakville, both of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed May 19, 1976, Ser. No. 687,887
Claims priority, application Canada, June 10, 1975, 229007
Int. Cl.[2] C01G *3/10, 51/10, 53/10, 45/10*
U.S. Cl. 423—35 **9 Claims**



1. A multistage process for cumulatively extracting metal values from sea nodules containing a major amount of manganese and iron, manganese being present in tetravalent form, and containing a lesser amount of at least one of the nonferrous metals nickel, cobalt and copper, and from an iron oxide ore containing a major amount of iron and a minor amount of at least one of the nonferrous metals selected from the group nickel, cobalt and copper, iron being present in an oxidation stage higher than the divalent state, comprising:

a. reductively leaching said iron oxide ore in an acidic medium in the presence of a non-oxidizing acid and a reducing agent at a temperature in the range of about 25° C to about 110° C, said acid being provided in sufficient amount to give a final pH for leaching said iron oxide ore of less than about 2 and said reducing agent being selected from the group H_2S, FeS, ammonium sulfide, alkali metal sulfides and alkaline earth metal sulfides, to form a product comprising a first leach solution containing divalent iron and said nonferrous metal values;
b. adjusting the pH of the first leach solution to at least about 3;
c. selectively leaching the sea nodules in the pH-adjusted first leach solution at a temperature in the range of about 25° C to about 110° C to reduce tetravalent manganese to the divalent state and to selectively extract nonferrous metal values from the manganiferous ore into solution while precipitating iron as hydrated ferric oxide, thereby forming a second leach solution containing nonferrous metal values derived from the iron oxide ore and the sea nodules ore; and
d. separating the second leach solution from the remaining residue.

4,065,543

CATALYTIC OXIDATION OF C_2–C_4 HALOGENATED HYDROCARBONS

Edward J. Sare, Clinton, and Jerome M. Lavanish, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 647,687, Jan. 9, 1976, abandoned. This application Nov. 15, 1976, Ser. No. 742,045
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—240 **22 Claims**

1. A method for treating a C_2–C_4 halogenated hydrocarbon

containing gas stream, said halogenated hydrocarbon being selected from the group consisting of chlorinated and brominated hydrocarbons, which comprises contacting the halogenated hydrocarbons with an oxidizing amount of oxygen-containing gas in the presence of hydrated cobalt oxide catalyst at temperatures within the range of from 20° to 500° C., for a time sufficient to reduce the halogenated hydrocarbon content of the gas stream, said temperature being such as to inhibit water-induced loss of catalyst activity.

4,065,544

FINELY DIVIDED METAL OXIDES AND SINTERED OBJECTS THEREFROM

Bernard H. Hamling, Warwick, and Alfred W. Naumann, Monsey, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 264,040, June 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 36,442, May 11, 1970, abandoned. This application June 20, 1974, Ser. No. 481,321

Int. Cl.[2] C01F *15/00*; C011 *17/00*; C01F *7/02*; C01G *1/02*

U.S. Cl. 423—252 **36 Claims**

1. Process for producing finely divided metal oxygen-containing compounds which comprises:

a. contacting a carbohydrate material with at least one compound of a metal to form an intimate mixture thereof;

b. introducing said mixture into a heating zone having a temperature sufficient to ignite said mixture but insufficient to substantially sinter said metal compound;

c. igniting said mixture in said heating zone for a time period sufficient to decompose and remove said carbohydrate material and produce easily disrupted agglomerates of submicron size metal oxygen-containing particles;

d. disrupting said agglomerates without substantially reducing the size of the individual particles which comprised said agglomerates to produce finely divided metal oxygen-containing compounds having a mean particle size below one micron.

4,065,545

STABILIZED HYPOCHLOROUS ACID AND HYPOCHLORITE SOLUTIONS

Philip Hugh Gamlen, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 4, 1977, Ser. No. 756,734

Claims priority, application United Kingdom, Jan. 29, 1976, 3545/76

Int. Cl.[2] C01B *11/04, 11/06*

U.S. Cl. 423—265 **8 Claims**

1. In an aqueous solution containing a hypochlorite selected from the group consisting of alkali metal hypochlorite, alkaline earth metal hypochlorite, and hypochlorous acid, and, as impurity, a metal compound selected from the group consisting of nickel, iron and copper compounds or mixtures of such compounds, the improvement wherein the solution also contains a stabilizing amount of periodate ions.

4,065,546

PROCESS FOR PREPARING HALOPHOSPHAZENE MIXTURES

James T. F. Kao, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 422,004, Dec. 5, 1973, abandoned. This application Dec. 8, 1975, Ser. No. 638,375

Int. Cl.[2] C01B *25/10*

U.S. Cl. 423—300 **7 Claims**

1. A process for producing high cyclic chlorophosphazene oligomers having the recurring unit $—NPCl_2)_n$ wherein n ranges from 3 to about 7, said process comprising establishing in an inert solvent a dispersion of finely divided ammonium chloride in an amount sufficient to initiate formation of chlorophosphazene by reacting hydrogen chloride with from about 10 to about 65 weight percent of the total ammonia used in the process, heating said dispersion to the reflux temperature of the solvent, adding simultaneously to said dispersion phosphorus pentachloride as a solution of from about 40 to about 70 weight percent of phosphorus pentachloride in an additional amount of said solvent at a rate such that no free concentration of phosphorus pentachloride is allowed to exist in the reaction mass and ammonia such that the total amount of ammonia employed for both the formation of ammonium chloride and the chlorophosphazene is from the theoretical amount required to react with phosphorus pentachloride to about 30 percent by weight in excess of the theoretical amount, maintaining the reflux temperature for from about ½ to about 2 hours after completing the addition and recovering the cyclic chlorophosphazene oligomers.

4,065,547

METHOD OF DEFLUORINATING PHOSPHORIC ACID

Maurice Leroy, Saint-Germain-en-Laye, and Jacques Helgorsky, Frepillon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Aug. 11, 1975, Ser. No. 603,732

Claims priority, application France, Aug. 13, 1974, 74.28029

Int. Cl.[2] C01B *25/16*

U.S. Cl. 423—321 S **13 Claims**

1. A method of defluorinating phosphoric acid comprising contacting the fluorine containing phosphoric acid in solution in a substantially water immiscible organic solvent with an aqueous medium containing in solution 0.2 to 5% by weight of a soluble compound of a metal selected from the group consisting of Al, Fe, Ti and Zr whereby phosphoric acid remains in the organic solvent while fluorine compounds are extracted from the organic solvent into the aqueous medium, separating the aqueous medium containing the fluorine compound from the organic solution containing the phosphoric acid, regenerating the separated organic solution by contact with an aqueous phase whereby phosphoric acid is extracted from the organic solution into the aqueous phase, and then separating the aqueous phase comprising phosphoric acid in which the fluorine content is less than 10 p.p.m. relative to the P_2O_5.

4,065,548

PREPARATION OF ALKALI-METAL AZIDES

Donald E. Tunison, Jr., Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1976, Ser. No. 744,562

Int. Cl.[2] C01B *21/08*

U.S. Cl. 423—410 **4 Claims**

1. In a process for the preparation and purification of alkali-metal azide by contacting with water a dilute two component slurry having a solid insoluble component of alkali-metal azide-/alkali-metal hydroxide double salt and a single phase liquid component consisting essentially of substantially anhydrous liquid ammonia to effect solution of at least a portion of said azide double salt and thereafter separating alkali-metal azide from the resultant solution; the improvement which comprises:

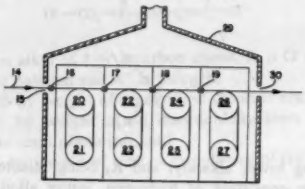
settling from said dilute slurry a layer of said double salt having a double salt concentration greater than said dilute slurry, separating said settled layer from supernatant slurry components excluded from the settled layer, then dissolving said layer in water to form a solution and thereafter recovering purified alkali-metal azide from said solution by crystallization.

4,065,549

HIGH TENSILE STRENGTH, HIGH YOUNG'S MODULUS CARBON FIBER HAVING EXCELLENT INTERNAL STRUCTURE HOMOGENEITY, AND PROCESS FOR PRODUCING THE SAME

Yoshiro Kinoshita, Masaki, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 622,954, Oct. 16, 1975, abandoned. This application Aug. 12, 1976, Ser. No. 713,629
Claims priority, application Japan, Oct. 21, 1974, 49-120365; Dec. 2, 1974, 49-138217
Int. Cl.[2] D01F 9/14, 9/22
U.S. Cl. 423—447.4 16 Claims



1. A process for producing a carbon fiber having high tensile strength which comprises oxidizing an organic polymeric fiber in an oxidizing atmosphere by intermittently contacting and removing said organic fiber on and from a heated body having a surface temperature from about 200° to about 400° C. wherein the contact time of said organic fiber on the heated body per single contact is less than about 1 second and the temperature of said oxidizing atmosphere is maintained lower thn the surface temperature of said heated body, and then carbonizing the oxidized fiber in a non-oxidizing atmosphere at a temperature above about 800° C.

4,065,550

PROCESS FOR PREPARING LITHIUM HEXAFLUOROARSENATE OF HIGH PURITY

Walter B. Ebner, Hartsville, and Charles Richard Walk, Collegeville, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 31, 1977, Ser. No. 764,490
Int. Cl.[2] C01B 27/02; C01D 15/00; C01B 11/18
U.S. Cl. 423—464 4 Claims

1. A process for producing lithium hexafluoroarsenate which comprises reacting approximately equimolecular proportions of lithium perchlorate and potassium hexafluoroarsenate in an inert organic solvent consisting essentially of a carboxylic acid ester of the formula $RCOOR_1$, wherein R is hydrogen or an alkyl radical of 1 to 4 carbon atoms and R_1 is an alkyl radical of 1 to 4 carbon atoms at a temperature up to about 70° C. in an inert atmosphere essentially free from water vapor, and recovering the lithium hexafluoroarsenate produced.

4,065,551

METHOD OF RECOVERING FLUORINE FROM CARBONACEOUS WASTE MATERIAL

Erik Qvale Dahl, Kristiansand S., Norway, assignor to Elkem-Spigerverket A/S, Oslo, Norway

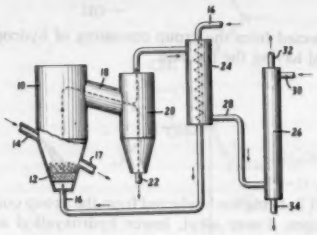
Continuation-in-part of Ser. No. 483,000, June 25, 1974, abandoned, which is a continuation of Ser. No. 112,585, Feb. 4, 1971, abandoned, which is a continuation-in-part of Ser. No. 795,472, Jan. 31, 1969, abandoned. This application Mar. 1, 1976, Ser. No. 662,719
Claims priority, application Norway, Feb. 1, 1968, 68406
Int. Cl.[2] C01B 7/22
U.S. Cl. 423—483 7 Claims

1. A continuous method of recovering fluorine as hydrogen fluoride from particles of fluorine-containing solid carbonaceous material by pyrohydrolysis which comprises:

a. a stream of gas comprising from 45to 50% steam;

b. continuously feeding solid carbonaceous material of less than about 10 millimeters in size onto the said stream of gas;

c. forming a fluidized bed by having said carbonaceous material suspended in said stream of gas;



d. maintaining a temperature of at least above 1100° C. in said fluidized bed for a sufficient time whereby said carbonaceous material is pyrohydrolyzed and evolves gaseous hydrogen fluoride; and

e. collecting said evolved hydrogen fluoride whereby the recovery of fluorine from said carbonaceous material by said method is from 88 to 98% of the fluorine contained in said carbonaceous material and whereby the efficiency of said method expressed as a ratio of kilograms of steam used per kilogram of fluorine recovered is from 13 to 15 .

4,065,552

METHOD OF DETECTING MALIGNANT NEOPLASMS

Giovanni Giacomo Costa, 100 Riley St., East Aurora, N.Y. 14502

Filed May 5, 1975, Ser. No. 574,754
Int. Cl.[2] A61K 29/00, 43/00
U.S. Cl. 424—1 18 Claims

1. A diagnostic test method for detecting malignant neoplasms employing as a tracer a radioactively labelled lipid selected from the group consisting of fatty acids, fat precursors, simple fats, phospholipids, steroids and sterols, the label being a stable or unstable isotope selected from the group consisting of carbon, hydrogen, oxygen and phosphorus wherein the metabolism of said lipid by subjects having malignant neoplasms is different than in subjects not having such neoplasms comprising:

a. administering to a subject under controlled conditions a predetermined amount of a radioactively labelled lipid tracer, capable of being metabolized by the subject;

b. waiting a sufficient time to allow for the metabolism of the labelled lipid tracer; and

c. determining by radioactive measurements the amount of radioactive catabolites in the excretion products.

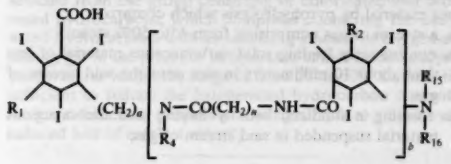
4,065,553

X-RAY CONTRAST MEDIA

Guy Tilly; Michel Jean Charles Hardouin, and Jean Lautrou, all of Aulnay-sous-Bois, France, assignors to Laboratoires Andre Guerbet, Aulnay-sous-Bois, France

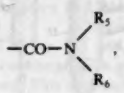
Division of Ser. No. 579,279, May 20, 1975, Pat. No. 4,014,986. This application Dec. 3, 1976, Ser. No. 747,621
Claims priority, application United Kingdom, May 31, 1974, 24169/74; July 31, 1974, 33900/74
Int. Cl.[2] A61K 29/02; C07C 103/84
U.S. Cl. 424—5 4 Claims

1. An iodobenzene derivative selected from the group consisting of a compound of formula

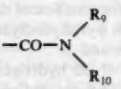


in which:

R_1 is selected from the group consisting of hydrogen and a radical having the formula



R_5 and R_6 being each selected from the group consisting of hydrogen, lower alkyl, lower hydroxyalkyl and lower alkanoyl-oxyalkyl, is selected from the group consisting of hydrogen and a radical having the formula



in which R_9 and R_{10} have the meanings given for R_5 and R_6, at least one of the radicals R_1 and R_2 being hydrogen,

R_4 is selected from the group consisting of hydrogen, lower alkyl and lower hydroxyalkyl,

R_{15} is selected from the group consisting of hydrogen, lower alkanoyl and polyhydroxy lower alkanoyl,

R_{16} is selected from the group consisting of hydrogen, lower alkyl, lower hydroxyalkyl and lower alkanoyl,

a is 0 or 1

n is an integer from 1 to 5

b is 1 or 2

and the different R_2, R_4 and n which exist when $b = 2$ may have the same or different meanings, a lower alkyl ester thereof and a salt with a pharmaceutically acceptable base.

2. An X-ray contrast medium comprising an aqueous solution of an effective amount of a compund as claimed in claim 1.

4,065,554

X-RAY CONTRAST MEDIA

Guy Tilly; Michel Jean Charles Hardouin, and Jean Lautrou, all of Aulnay-sous-Bois, France, assignors to Laboratoires Andre Guerbet, Aulnay-sous-Bois, France

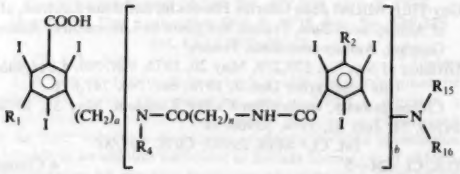
Division of Ser. No. 579,279, May 20, 1975, Pat. No. 4,014,986. This application Dec. 6, 1976, Ser. No. 747,810

Claims priority, application United Kingdom, May 31, 1974, 24169/74; July 31, 1974, 33900/74

Int. Cl.[2] A61K *29/02;* **C07C** *103/84*

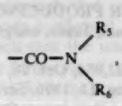
U.S. Cl. 424—5 **4 Claims**

1. An iodobenzene derivative selected from the group consisting of a compound of formula

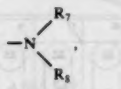


in which:

R_1 is selected from the group consisting of a radical having the formula

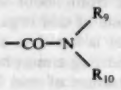


R_5 and R_6 being each selected from the group consisting of hydrogen, lower alkyl, lower hydroxyalkyl and lower alkanoyloxyalkyl and a radical of the formula

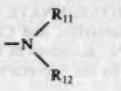


R_7 being lower alkanoyl and R_8 being selected from the group consisting of hydrogen, lower alkyl and lower hydroxyalkyl,

R_2 is selected from the group consisting of a radical having the formula

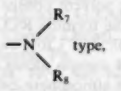


in which R_9 and R_{10} have the meanings given for R_5 and R_6, and a radical of the formula



in which R_{11} has the meaning given for R_7 or represents hydrogen and R_{12} has the meaning given for R_8,

at least one of the radicals R_1 and R_2 being of



type,

R_4 is selected from the group consisting of hydrogen, lower alkyl and lower hydroxyalkyl,

R_{15} is selected from the group consisting of hydrogen, lower alkanoyl and polyhydroxy lower alkanoyl,

R_{16} is selected from the group consisting of hydrogen, lower alkyl, lower hydroxyalkyl and lower alkanoyl,

a is 0 or 1

n is an integer from 1 to 5

b is 1 or 2

and the different R_2, R_4 and n which exist when $b = 2$ may have the same or different meanings,

a lower alkyl ester thereof and a salt with a pharmaceutically acceptable base.

2. An X-ray contrast medium comprising an aqueous solution of an effective amount of a compound as claimed in claim 1.

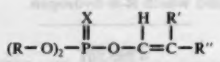
4,065,555
INSECTICIDAL COMPOSITIONS EMPLOYING CERTAIN BLOCK COPOLYMERS

Richard C. Potter, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 94,586, Dec. 2, 1970, abandoned. This application May 15, 1972, Ser. No. 253,583
Int. Cl.[2] A01n *9/36*
U.S. Cl. 424—83 **10 Claims**

1. An insecticidal composition comprising

a. 5–50% by weight of a volatile insecticidal compound of the formula



wherein R is alkyl of 1 or 2 carbon atoms, X is O or S, R′ is hydrogen or halogen and R″ is halogen;

b. 20–75% by weight of a polyvinyl chloride resin;

c. 0–40% by weight of an insecticidally inert polyvinyl chloride resin plasticizer; and

d. 1–30% by weight of a block copolymer of the formula

A-B—A)$_m$, A-B—B-A)$_n$ or A—B-A)$_n$

wherein A is a polymer block of styrene or alpha-methyl styrene having a molecular weight of about 5,000 to 100,000, B is a polymer block of butadiene or isoprene having a molecular weight of about 15,000 to 500,000, *m* is 0 or 1 and *n* is an integer from 2 to 5 or the hydrogenated derivatives thereof.

4,065,556
TUBERCIDIN PREPARATION

Charles G. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 557,759, March 12, 1975, abandoned, which is a continuation of Ser. No. 435,272, Jan. 21, 1974, abandoned, which is a continuation of Ser. No. 278,836, Aug. 8, 1972, abandoned, which is a continuation of Ser. No. 113,656, Feb. 8, 1971, abandoned, which is a continuation of Ser. No. 810,925, March 24, 1969, abandoned, which is a continuation of Ser. No. 529,664, Aug. 9, 1967, abandoned. This application May 24, 1976, Ser. No. 689,474
Int. Cl.[2] A61K *31/71, 31/70, 35/14*
U.S. Cl. 424—181 **2 Claims**

1. Tubercidin-containing human red blood cells prepared by:

1. mixing whole blood and a physiological saline solution of tubercidin, the amount of tubercidin providing a concentration of 50 to 200 mcg. per milliliter of the blood;

2. incubating the mixture of blood and tubercidin for from 30 to 60 minutes at from room temperature to 37° C.; and

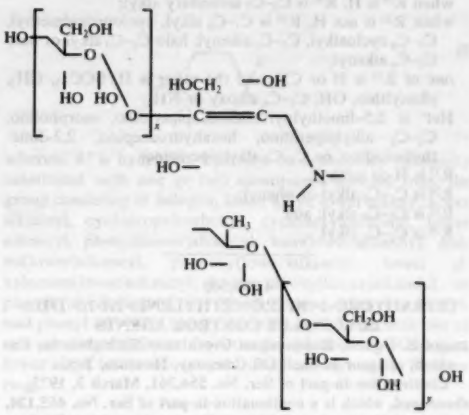
3. centrifuging the incubated mixture to recover the tubercidin-containing red blood cells.

4,065,557
AMINO SUGARS AND THEIR USE IN IMPROVING THE MEAT:FAT RATIO IN ANIMALS

Werner Frommer, Wuppertal; Horst Gericke, Leichlingen; Uwe Keup, Wuppertal; Walter Puls, Wuppertal; Delf Schmidt, Wuppertal, and Otto Wagner, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 557,264, March 11, 1975, abandoned. This application July 13, 1976, Ser. No. 704,842
Claims priority, application Germany, Mar. 21, 1974, 2413720
Int. Cl.[2] A61K *31/71, 31/715;* **C12D** *13/04*
U.S. Cl. 424—181 **38 Claims**

25. The method of influencing the utilization of feed in an animal by reducing formation of fat and thereby increasing the meat:fat ratio in the animal in favor of a higher proportion of meat which comprises orally administering to said animal an effective amount of at least one amino-sugar as herein defined, said amino-sugar having the conformational formula:



wherein

y has a value of 1 to 8 and

x has a value of from 0 to 7,

the sum of $y + x$ being from 1 to 8.

4,065,558
SOIL TREATMENT INSECTICIDE

Fred Morris Gordon, Princeton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 307,712, Nov. 17, 1972, abandoned, which is a continuation of Ser. No. 204,678, Dec. 3, 1971, abandoned. This application Oct. 20, 1975, Ser. No. 624,159
Int. Cl.[2] A01N *9/36*
U.S. Cl. 424—216 **2 Claims**

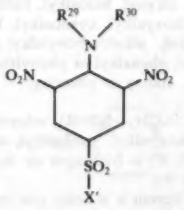
1. A method for protecting a corn crop characterized by providing it with residual pesticidal protection throughout the growing season against attack in the soil by corn rootworms by applying an insecticidally effective amount of the compound O,O-diethyl-S-(tert-butylthio)methyl phosphorodithioate to the soil in which said corn crop is grown.

4,065,559
DINITROANILINES FOR CONTROL OF SOIL-BORNE PHYTOPATHOGENS

James D. Froyd, Fountaintown, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 19, 1976, Ser. No. 668,359
Int. Cl.[2] A01N *9/16*
U.S. Cl. 424—229 **8 Claims**

1. A method of reducing the adverse effects of soil-borne phytophthora phytopathogens which comprises applying to soil infested with such phytopathogens a fungicidally-effective amount of a compound of the formula



wherein

X' is $N(R^{31})_2$, $N(R^{33})CH_2Het'$, $N{=}CHN(CH_3)_2$, $N{=}C(R^{34})OR^{35}$, or $N{=}CHOR^{36}$;
R^{29} is H, C_3–C_4 alkenyl or C_1–C_4 alkyl;
when R^{29} is H, R^{30} is C_3–C_7 secondary alkyl;
when R^{29} is not H, R^{30} is C_1–C_5 alkyl, cyclopropylmethyl, C_5–C_6 cycloalkyl, C_3–C_4 alkenyl, halo C_2–C_3 alkyl or halo C_3–C_4 alkenyl;
one of R^{31} is H or CH_3 and the other is H, $SCCl_3$, CH_3, phenylthio, OH, C_1–C_4 alkoxy or NH_2;
Het' is 2,5-dimethylpyrrolidino, piperidino, morpholino, C_1–C_2 alkylpiperidino, hexahydroazepino, 2,2-dimethylaziridino, or C_1–C_2 alkylpiperazino;
R^{33} is H or methyl;
R^{34} is C_1–C_2 alkyl or phenyl;
R^{35} is C_1–C_4 alkyl; and
R^{36} is C_1–C_2 alkyl.

4,065,560

TETRAHYDRO-2-(NITROMETHYLENE)-2H-1,3-THIAZINE INSECT CONTROL AGENTS

James E. Powell, Rodmersham Green near Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

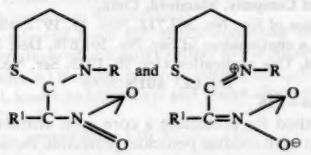
Continuation-in-part of Ser. No. 554,361, March 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 468,124, May 8, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,228

Int. Cl.[2] A01N *9/12*

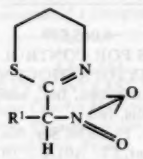
U.S. Cl. 424—246 **4 Claims**

1. A method for killing insects which comprises subjecting them to the action of an insecticidally effective amount of a compound selected from the group consisting of:

1. a resonance hybrid in which the two significant forms which contribute thereto are represented by the formulae



and including when R is hydrogen, the tautomeric form represented by the formula



wherein R is hydrogen or contains up to eight carbon atoms and is one of: alkyl, alkeny;, alkoxyalkyl, cycloalkylalkyl, cyanoalkyl, haloalkenyl, phenalkyl or alkoxycarbonylvinyl;

R^1 is hydrogen or contains up to eight carbon atoms and is one of

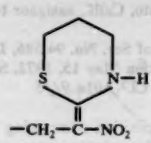
a. alkyl, alkenyl, alkynyl, haloalkyl, haloalkenyl, halo (hydroxy)alkyl, alkoxyalkyl, cyanoalkyl, hydroxyalkyl, alkoxycarbonylalkyl, alkylcarbonylalkyl,alkylthioalkyl, alkylsulfinylalkyl, phenalkyl or phenylthio optionally substialkyl, phenyl, alkoxy or phenoxy;

b. halogen;

c. aminomethyl, $—CH_2—NR^2R^3$, wherein R^2 is alkyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, alkenyl, phenyl or phenalkyl, and R^3 is hydrogen or one of the moieties represented by R^2;

d. $(CH_2)_n—R^4$, wherein *n* is zero, one or two, and R^4 is a heteromonocyclic moiety of from five to six atoms in the ring, containing in the ring carbon atoms and one to two of oxygen (—O—), sulfur (—S—) or nitrogen (=N— or —NH—) bonded to carbon in the ring; and

(e)



2. the alkali metal, alkyl halide, ammonium or amine salt of such a compound which R is hydrogen.

4,065,561

METHOD OF INDUCING SKELETAL MUSCLE RELAXATION

Myron Michael Gassel, 34555 Scenic Drive, Dana Point, Calif. 92629

Filed June 30, 1975, Ser. No. 592,124

Int. Cl.[2] A61K *31/44*

U.S. Cl. 424—263 **6 Claims**

1. A method for inducing skeletal muscle relaxation in a mammal suffering from a pathological state characterized by hyperactivity of the spinal reflex arc, which comprises the administration to said mammal of a pharmaceutically effective non-toxic amount of 1-methyl-2-(3-pyridyl) pyrrole.

4,065,562

METHOD AND COMPOSITION FOR REDUCING BLOOD GLUCOSE LEVELS

Katsuya Ohata, Uji; Hiroshi Enomoto, Kyoto; Yoshiaki Yoshikuni, Kyoto; Tatsuhiko Kono, Kyoto, and Masahiro Yagi, Otsu, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Filed Dec. 20, 1976, Ser. No. 752,006

Claims priority, application Japan, Dec. 29, 1975, 50-157425; Jan. 1, 1976, 51-239

Int. Cl.[2] A61K *31/445*

U.S. Cl. 424—267 **4 Claims**

1. The method of reducing blood glucose levels and inhibiting lipid biosynthesis in humans and other animals which comprises orally, rectally or parentally administering thereto an effective amount of 2-hydroxymethyl-3,4,5-trihydroxypiperidine.

4,065,563

3-HETERO-5-ISOTHIOCYANOPHENYL OXADIAZOLES AS ANTIFUNGAL AND ANTIBACTERIAL AGENTS

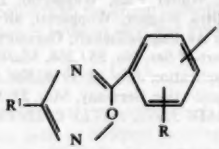
Venkatachala L. Narayanan, Hightstown, N.J.; Hans H. Gadebusch, Yardley, Pa., and Rudiger D. Haugwitz, Titusville, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 555,511, March 5, 1975, Pat. No. 4,022,901. This application Jan. 21, 1977, Ser. No. 761,091

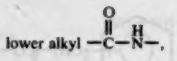
Int. Cl.[2] A61K *31/38, 31/42*

U.S. Cl. 424—272 **9 Claims**

1. A method for treating fungal infections and/or bacterial infections, which comprises administering to a mammalian host an effective amount of a compound of the formula



wherein R is selected from the group consisting of hydrogen, lower alkyl, halogen, trifluoromethyl, lower alkoxy, phenoxy, di(lower alkyl)amino,



phenyl, or phenyl substituted with halogen, nitro, trifluoromethyl, lower alkyl or lower alkoxy, R^1 is a heterocyclic group selected from the group consisting of thienyl, furyl, pyrryl, imidazolyl, oxazolyl, and any of the above groups substituted by lower alkyl substituent, a lower alkoxy substituent or a halo substituent.

4,065,564

ANTIPERSPIRANT SOLUTION CONTAINING A SUBSTANTIALLY NON-VOLATILE SILOXANE LIQUID

John J. Miles, Jr., Lake Intervale, and William Netzbandt, Dumont, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,378
Int. Cl.[2] A61K *7/34, 7/38*
U.S. Cl. 424—66 **14 Claims**

1. An antiperspirant solution suitable for pump spray or roll-on application consisting essentially of an alcohol soluble aluminum chlorhydroxide complex; a sufficient amount of a polyorgano-siloxane selected from the group consisting of polyphenylmethyl siloxane, poly-higher alkyl siloxane and mixtures thereof to substantially reduce the tackiness of said complex during drying; and a sufficient amount of alcohol to result in said solution; said composition being characterized by having substantially reduced tackiness when applied from a pump spray or a roll-on applicator and a substantially reduced tendency to malfunction when applied from said pump spray or roll-on applicator.

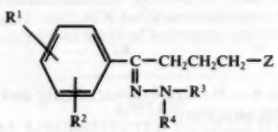
4,065,565

ACYLHYDRAZONES AND ANTI-PSYCHOTIC COMPOSITIONS THEREOF

Kikuo Sasajima, Toyonaka; Keiichi Ono, Nishinomiya; Masaru Nakao, Toyonaka; Isamu Maruyama, Minoo; Shigenari Katayama; Shigeho Inaba, both of Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

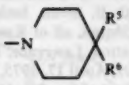
Filed Aug. 12, 1975, Ser. No. 603,813
Claims priority, application Japan, Aug. 13, 1974, 49-92985
Int. Cl.[2] C07D *241/04*
U.S. Cl. 424—250 **9 Claims**

1. A compound of the formula:



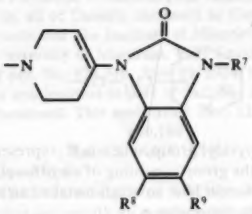
wherein

R^1 is halogen, R^2 is hydrogen, halogen or benzoylamino of which the benzoyl is optionally substituted with one or two substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower alkanoyl, cyclopropylcarbonyl, cyclohexylcarbonyl, lower alkenoyl, phenyl(lower)alkanoyl, halo(lower)alkanoyl, amino(lower)alkanoyl, phenoxy(lower)-alkanoyl, lower alkylamino(lower)alkanoyl, lower alkoxy(lower)alkanoyl, or phenyl(lower)alkenoyl, R^3 is hydrogen or lower alkyl, R^4 is benzoyl, lower alkanoyl, phenyl(lower)alkanoyl, cyclopropylcarbonyl, cyclohexylcarbonyl or phenoxy(lower)alkanoyl and Z is a group having the formula:



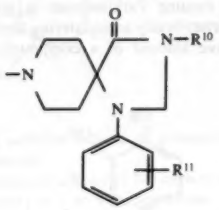
(I)

wherein R^5 is hydrogen, hydroxyl or benzoyloxy optionally substituted with one or two substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower alkanoyl, cyclopropylcarbonyl, cyclohexylcarbonyl, lower alkenoyl, phenyl(lower)alkanoyl, halo(lower)alkanoyl, amino(lower)alkanoyl, phenoxy(lower)alkanoyl, lower alkylamino(lower)alkanoyl, lower alkoxy(lower)alkanoyl, or phenyl(lower)alkenoyl, and R^6 is hydrogen, phenyl or benzyl, said phenyl or benzyl being optionally substituted with one or two substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy and trifluoromethyl on the benzene ring;



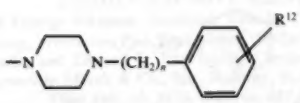
(II)

wherein the dotted line indicates the optional presence of an additional single bond linkage, R^7 is hydrogen or lower alkyl and R^8 and R^9 are each hydrogen, halogen or lower alkyl;



(III)

wherein R^{10} is hydrogen or lower alkyl and R^{11} is hydrogen, halogen, lower alkyl or lower alkoxy; or



(IV)

wherein R^{12} is hydrogen, halogen, lower alkyl, lower alkoxy or trifluoromethyl and n is an integer of from 0 to 2, or a pharmaceutically acceptable salt thereof.

4,065,566

N-NICOTINOYL-3,4-DINICOTINOYLOXY-L-PHENYLALANINE AND DERIVATIVES PHARMACEUTICAL COMPOSITIONS AND METHODS CONTAINING SAME

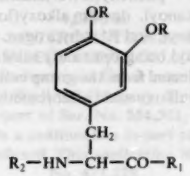
Nicolae S. Bodor; Kenneth B. Sloan, both of Lawrence, and Anwar A. Hussain, Lexington, all of Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 569,009, April 17, 1975, Pat. No. 3,998,779, which is a continuation-in-part of Ser. No. 412,419, Nov. 2, 1973, Pat. No. 3,891,696. This application Sept. 7, 1976, Ser. No. 720,781

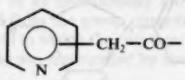
Int. Cl.[2] C07D *213/56;* A61K *31/44*

U.S. Cl. 424—266 **6 Claims**

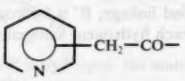
1. A pro-drug compound of L-DOPA having the formula:



wherein R represents a

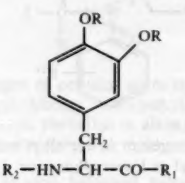


group or a —CO-pyridyl group; wherein R_1 represents a member selected from the group consisting of a hydroxyl group and a —OM group, wherein M is an alkali metal or an ammonium ion; and wherein R_2 represents a

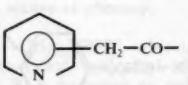


group or a —CO-pyridyl group.

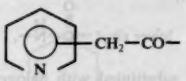
2. A method for treating Parkinsonism in warm-blooded animals which comprises orally administering thereto, an anti-Parkinsonism effective amount of a compound having the formula:



wherein R represents a



group or a —CO-pyridyl group; wherein R_1 represents a member selected from the group consisting of a hydroxyl group and a —OM group, wherein M is an alkali metal or an ammonium ion; and wherein R_2 represents a



group or a —CO-pyridyl group.

4,065,567

SUBSTITUTED NITROIMIDAZOLYL THIADIAZOLES AND OXADIAZOLES AS ANTIBACTERIAL AGENTS AND GROWTH PROMOTING COMPOUNDS

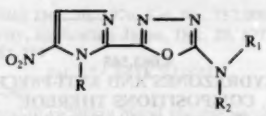
Gerald Berkelhammer, Princeton, and Goro Asato, Titusville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 562,523, March 27, 1975, Pat. No. 3,991,200, which is a division of Ser. No. 463,951, April 25, 1974, Pat. No. 3,904,756, which is a division of Ser. No. 199,005, Nov. 15, 1971, Pat. No. 3,830,924, which is a continuation-in-part of Ser. No. 17,977, March 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 814,205, April 7, 1969, abandoned, which is a continuation-in-part of Ser. No. 659,596, Aug. 10, 1967, Pat. No. 3,452,035, which is a continuation-in-part of Ser. No. 604,158, Dec. 23, 1966, abandoned. This application July 16, 1976, Ser. No. 706,101

Int. Cl.[2] A61K *31/42*

U.S. Cl. 424—272 **11 Claims**

1. A method of controlling the growth of bacteria in warm-blooded animals which comprises orally administering to said animals an antibacterially effective amount of a nitroimidazole of the formula:



wherein R is selected from the group consisting of lower alkyl, hydroxy lower alkyl, lower alkanoyloxy lower alkyl and benzyl; and R_1 and R_2 are selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms, hydroxy lower alkyl, lower alkoxy lower alkyl, cyclohexyl, formyl, lower alkanoyl, monochlorolower alkanlyl, dichloro lower alkanoyl, lower alkyl aminolower alkyl;

taken together is —N=CHN (lower alkyl)$_2$; and physiologically acceptable salts thereof.

4,065,568

3-CARBO(LOWER ALKOXY)HYDRAZINOINDAZOLES

Karl Heinrich Mayer, Opladen; Friedrich Hoffmeister, and Wolfgang Wuttke, both of Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

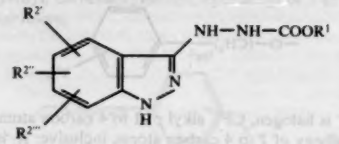
Filed Nov. 24, 1975, Ser. No. 634,913

Claims priority, application Germany, Dec. 13, 1974, 2458966

Int. Cl.[2] A61K *31/415;* C07D *231/56*

U.S. Cl. 424—273 P **12 Claims**

1. A compound selected from the group consisting of a 3-carbo(lower alkoxy)hydrazinoindazole of the formula:



wherein

R^1 is lower alkyl; and each of $R^{2'}$, $R^{2''}$ and $R^{2'''}$ is selected, independently of the others, from the group consisting of hydrogen, lower alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, nitro, amino, lower alkylamino of 1 to 6 carbon atoms, di(lower alkyl of 1 to 6 carbon atoms)amino, lower alkanoylamino of 1 to 6 carbon atoms, carbo(lower alkoxy of 1 to 6 carbon atoms-)amino, halo, trifluoromethyl, cyano and carbo(lower alkoxy of 1 to 6 carbon atoms),

and the pharmaceutically acceptable nontoxic salts thereof.

11. The method of achieving an analgesic, anti-inflammatory and/or anti-pyretic effect in humans and other warm blooded animals in need thereof which comprises administering thereto an analgesic, anti-inflammatory and/or anti-pyretic effective amount of a compound according to claim **1**.

4,065,569

USE OF 2-IMIDAZOLINES AS HYPOGLYCEMIC AGENTS

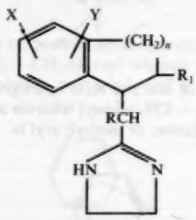
Heide Roebke, Belleville, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 582,313, May 30, 1975, Pat. No. 3,992,403. This application Aug. 25, 1976, Ser. No. 717,800

Int. Cl.[2] **A61K** *31/415*

U.S. Cl. 424—273 R **11 Claims**

1. A method for eliciting a hypoglycemic effect in warmblooded animals having a hyperglycemic condition which comprises administering a therapeutically effective quantity of a compound of the structural formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein each of X and Y are hydrogen or fluoro, each of R and R_1 are lower alkyl or hydrogen, and *n* is an integer 1 to 3.

4,065,570

ANTIVIRAL 5-(SUBSTITUTED BENZAL) HYDANTOINS

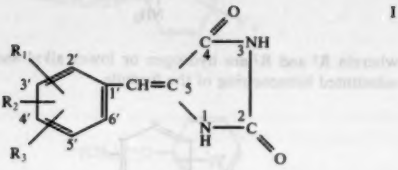
Kekhusroo R. Bharucha, Toronto; Djordje Ajdukovic, Montreal; Vytautas Pavilanis, Westmount, and Heinrich Maria Schrenk, Don Mills, all of Canada, assignors to Canada Packers Limited, Toronto and The Institute of Microbiology and Hygiene of The University of Montreal, Ville Laval, both of, Canada

Division of Ser. No. 478,310, June 11, 1974, Pat. No. 4,013,770, which is a continuation-in-part of Ser. No. 262,920, June 16, 1972, abandoned. This application Dec. 12, 1975, Ser. No. 640,167

Int. Cl.[2] **A61K** *31/415*

U.S. Cl. 424—273 R **18 Claims**

1. A method of treating a virus infection caused by an entervirus selected from the group consisting of poliomyelitis, coxsackie and echo viruses which comprises administering to a mammal in need of said treatment a non-toxic amount effective to treat said virus of said group of a compound of the formula;



I

wherein:

formula I includes individual geometrical isomers or mixtures thereof,

R_1 is hydrogen or alkoxy of 1–4 carbon atoms, R_2, and R_3 are each alkoxy of 1 to 4 carbon atoms,

and R_4 and R_5 are each hydrogen or alkanoyl containing from 1 to 20 carbon atoms with the proviso that one of R_4 and R_5 is alkanoyl.

4,065,571

ANTIVIRAL 5-(SUBSTITUTED BENZAL) HYDANTOINS

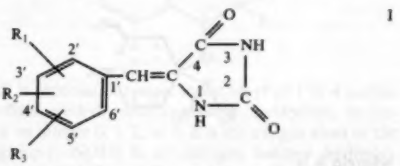
Kekhusroo R. Bharucha, Toronto; Djordje Ajdukovic, Montreal; Vytautas Pavilanis, Westmount, and Heinrich Maria Schrenk, Don Mills, all of Canada, assignors to Canada Packers Limited, Toronto and The Institute of Microbiology and Hygiene of The University of Montreal, Ville Laval, both of, Canada

Division of Ser. No. 478,310, June 11, 1974, Pat. No. 4,013,770, which is a continuation-in-part of Ser. No. 262,920, June 16, 1972, abandoned. This application Dec. 12, 1975, Ser. No. 640,168

Int. Cl.[2] **A61K** *31/411*

U.S. Cl. 424—273 R **15 Claims**

1. A method of treating virus infections in cattle which are caused by foot and mouth virus which comprises administering to such an animal which is in need of said treatment a non-toxic amount effective to treat said virus of said group of a compound of the formula:



I

wherein:

formula I includes individual geometrical isomers or mixtures thereof,

R_1 is hydrogen or alkoxy of 1–4 carbon atoms, R_2, and R_3 are each alkoxy of 1 to 4 carbon atoms

and R_4 and R_5 are each hydrogen or alkanoyl containing from 1 to 20 carbon atoms with the proviso that one of R_4 and R_5 is alkanoyl.

4,065,572

AMINO ACIDS AND ESTERS THEREOF USEFUL AS ANTIHYPERTENSIVE AGENTS

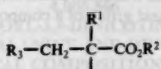
Joseph George Atkinson, Montreal, Canada; Clarence Stanley Rooney, Worcester, Pa.; Yves Girard, Dollard des Ormeaux, Canada, and Edward L. Engelhardt, Gwynedd Valley, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 13, 1976, Ser. No. 657,827

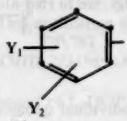
Int. Cl.[2] **A01N** *9/22;* **A61K** *31/415;* **C07D** *231/00, 233/04*

U.S. Cl. 424—273 R **14 Claims**

1. A compound of the formula



wherein R^1 and R^2 are hydrogen or lower alkyl and R^3 is a substituted benzene ring of the formula



wherein Y_1 is hydrogen, cyanoamino, carboxyl, cyano, thiocarbamoyl, aminomethyl, guanidino, hydroxy, methanesulfonamido, nitro, amino, methanesulfonyloxy, carboxymethoxy, or methoxy and Y_2 is a substituted or unsubstituted 5-membered heterocyclic ring containing one or more nitrogen atoms.

2. A composition useful for treating hypertension comprising a therapeutically effective amount of a compound of claim 1 in combination with a pharmaceutically acceptable carrier.

4,065,573

4-AMINO-4-PHENYLCYCLOHEXANONE KETAL COMPOSITIONS AND PROCESS OF USE

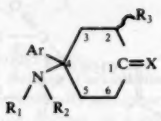
Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 3, 1976, Ser. No. 692,589

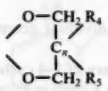
Int. Cl.[2] A61K *31/335;* **C07D** *319/04, 317/72*

U.S. Cl. 424—278 **72 Claims**

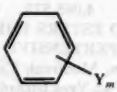
1. A compound of the formula:



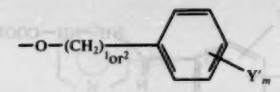
wherein X is



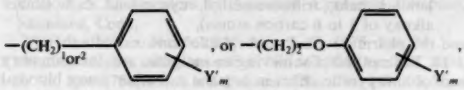
wherein n is zero or one and R_4 is hydrogen or methyl; R_5 is hydrogen, phenyl, —CH_2-alkenyl wherein alkenyl is of 2 to 4 carbon atoms, inclusive, or methyl; aryl is



wherein m is zero, one or two, and Y is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, alkoxy of 1 to 4 carbon atoms, inclusive, hydroxy, cycloalkyloxy of 3 to 6 carbon atoms, inclusive, alkanoyloxy of 2 to 4 carbon atoms, inclusive, alkylthio of 1 to 4 carbon atoms, inclusive, or

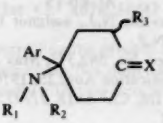


where Y' is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, or alkoxy of 1 to 4 carbon atoms, inclusive; R_1 is hydrogen, or alkyl of 1 to 8 carbon atoms, inclusive, R_2 is hydrogen, alkyl of 1 to 8 carbon atoms, inclusive, —CH_2-alkenyl wherein alkenyl is of 2 to 8 carbon atoms, inclusive, acetyl, cycloalkylalkyl wherein cycloalkyl is of 3 to 6 carbon atoms, inclusive, and alkyl is of 1 to 3 carbon atoms, inclusive, β-hydroxyethyl, carbethoxymethyl, cycloalkyl of 3 to 6 carbon atoms, inclusive,

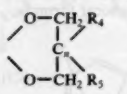


and R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, inclusive, and the acid addition salts thereof.

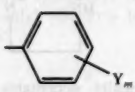
51. A pharmaceutical composition in unit dosage form for relieving pain in animals comprising as an active ingredient an analgetic effective amount of a compound of the formula:



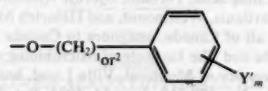
wherein X is



wherein n is zero or one and R_4 is hydrogen or methyl; R_5 is hydrogen, phenyl, —CH_2-alkenyl wherein alkenyl is of 2 to 4 carbon atoms, inclusive, or methyl; aryl is

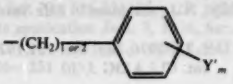


wherein m is zero, one or two, and Y is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, alkoxy of 1 to 4 carbon atoms, inclusive, hydroxy, cycloalkyloxy of 3 to 6 carbon atoms, inclusive, alkanoyloxy of 2 to 4 carbon atoms, inclusive, alkylthio of 1 to 4 carbon atoms, inclusive, or

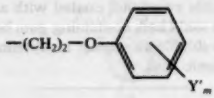


where Y' is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, or alkoxy of 1 to 4 carbon atoms, inclusive; R_1 is hydrogen, or alkyl of 1 to 8 carbon atoms, inclusive, R_2 is hydrogen, or alkyl of 1 to 8 carbon atoms, inclusive, —CH_2-alkenyl wherein alkenyl is of 2 to 8 carbon atoms, inclusive, acetyl, cycloalkylalkyl wherein cycloalkyl of 3 to 6 carbon atoms, inclusive, and alkyl is of 1 to 3 carbon atoms, inclusive, β-

hydroxyethyl, carbethoxymethyl, cycloalkyl of 3 to 6 carbon atoms, inclusive,

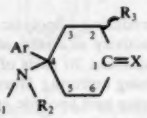


or

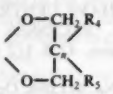


and R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, inclusive, and the acid addition salts thereof, in association with a pharmaceutical carrier.

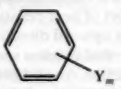
62. A process for inducing analgesia in humans and animals comprising the administration of an analgetic amount of a compound of the formula:



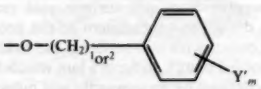
wherein X is



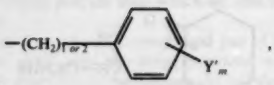
wherein n is zero or one and R_4 is hydrogen or methyl; R_5 is hydrogen, phenyl, —CH_2-alkenyl wherein alkenyl is of 2 to 4 carbon atoms, inclusive, or methyl; aryl is



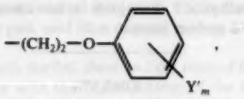
wherein m is zero, one or two, and Y is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, alkoxy of 1 to 4 carbon atoms, inclusive, hydroxy, cycloalkyloxy of 3 to 6 carbon atoms, inclusive, alkanoyloxy of 2 to 4 carbon atoms, inclusive, alkylthio of 1 to 4 carbon atoms, inclusive, or



where Y' is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, or alkoxy of 1 to 4 carbon atoms, inclusive; R_1 is hydrogen, or alkyl of 1 to 8 carbon atoms, inclusive, R_2 is hydrogen, alkyl of 1 to 8 carbon atoms, inclusive, —CH_2-alkenyl-wherein alkenyl is of 2 to 8 carbon atoms, inclusive, acetyl, cycloalkylalkyl wherein cycloalkyl is of 3 to 6 carbon atoms, inclusive, and alkyl is of 1 to 3 carbon atoms, inclusive, β-hyhydroyethyl, carbethoxymethyl, cycloalkyl of 3 to 6 carbon atoms, inclusive,



or



and R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, inclusive, and the acid addition salts thereof, to a human or animal subject.

4,065,574

NEW METHOD FOR CONTROLLING FUNGI USING 4-CHROMONE, 4-CHROMANONE, 4-CHROMONE OXIME AND 4-CHROMANONE OXIME COMPOUNDS

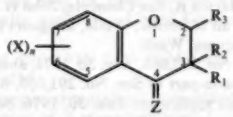
Malcolm W. Moon, Kalamazoo, Mich., and John C. Sharp, Marlinton, W. Va., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 608,850, Aug. 29, 1975, abandoned, which is a continuation of Ser. No. 457,053, April 1, 1974, abandoned. This application Aug. 12, 1976, Ser. No. 713,922

Int. Cl.[2] A01N *9/28*

U.S. Cl. 424—283 **12 Claims**

1. A method for controlling fungi comprising the appliction of an effective antifungal amount of a compound of the formula:



wherein X is chlorine, bromine, lower alkyl of 1 to 4 carbon atoms, trifluoromethyl, methoxy, ethoxy, methylthio, or ethylthio; n is an integer 0, 1, 2, or 3; Z is the oxygen atom or the oximino group (=NOH); R_3 is hydrogen, halogen, hydroxyl, or lower alkyl; and R_1 and R_2 are halogen, lower alkyl, or hydrogen provided that X and n are selected independently and that 6-X is 6-chloro or 6-bromo when R_3 is hydroxyl, applied to fungi.

4,065,575

3-AMINOMETHYL DERIVATIVES OF 4-CHROMANONE

Maurice Joullié, Saint-Germain-en-Laye; Gabriel Maillard, Paris; Lucien Lakah, Paris, and Christian Jean Marie Warolin, Paris, all of France, assignors to Joullie International, Neuilly-sur-Seine, France

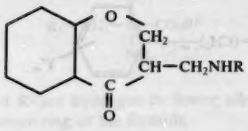
Filed Feb. 20, 1976, Ser. No. 659,708

Claims priority, application France, Feb. 20, 1975, 75.05298

Int. Cl.[2] A61K *31/35*; C07D *311/02*

U.S. Cl. 424—283 **2 Claims**

1. A method of providing a vasodilating effect to a subject requiring a vasodilating effect which comprises administering to said subject a vasodilating effective amount of a compound of the formula:



wherein R is alkyl of 1 through 6 carbon atoms or alkoxyalkyl of 2 through 6 carbon atoms.

4,065,576

METHOD FOR USING A RUMINANT REPELLENT COMPRISING OXIDATION PRECURSORS OF ALIPHATIC ALDEHYDES

Katashi Oita; Marion R. San Clemente; John H. Oh, and George T. Tiedeman, all of Seattle, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 502,003, Aug. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 291,059, Sept. 21, 1972, abandoned. This application July 12, 1976, Ser. No. 704,364

Int. Cl.² A01N *9/24*

U.S. Cl. 424—318 **8 Claims**

1. A method for discouraging ruminants from browsing on leaves normally eaten by said ruminants comprising applying a mixture of a repellent-producing amount of an ingredient comprising oleic acid or an alkali metal, alkaline earth metal or ammonium salt of oleic acid and a repellent-producing amount of an additional ruminant repellent to leaves normally eaten by ruminants in a nonphytotoxic amount effective to discourage browsing of said leaves by said ruminants.

4,065,577

METHOD FOR USING A RUMINANT REPELLENT COMPRISING ALIPHATIC ALDEHYDES

Katashi Oita; Marion R. San Clemente; John H. Oh, and George T. Tiedeman, all of Seattle, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Division of Ser. No. 502,003, Aug. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 291,059, Sept. 21, 1972, abandoned. This application June 30, 1976, Ser. No. 701,110

Int. Cl.² A01N *9/24*

U.S. Cl. 424—333 **4 Claims**

1. A method for discouraging ruminants from browsing material normally eaten by said ruminants comprising:

contacting said material with an amount of a repellent composition effective to discourage browsing of said material by said ruminants, said repellent composition containing as the principal active repellent ingredient a volatile aliphatic aldehyde.

4,065,578

XYLITOL CHEWING GUM WITH HYDROPHILLIC COLLOID BINDER

Richard A. Reggio, Yorktown Heights, N.Y.; Dominick R. Friello, Danbury, and John E. Beam, Norwalk, both of Conn., assignors to Life Savers, Inc., New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,928

Int. Cl.² A23G *3/30*

U.S. Cl. 426—3 **14 Claims**

1. A sugarless chewing gum in the form of a soft, moist, continuous cohesive gum, which comprises gum base, xylitol as a bulk filler and sweetener, and a hydrocolloid selected from the group consisting of xanthan gum or an alginate derivative of kelp as a binder to facilitate formation of the soft, moist, continuous cohesive gum, said hydrocolloid being present in an amount within the range of from about 0.03 to about 1.0% by weight of said chewing gum.

4,065,579

LONG-LASTING FLAVORED CHEWING GUM INCLUDING CHALK-CONTAINING GUM BASE

Donald A. M. Mackay, Pleasantville, NY, and Daniel Schoenholz, Basking Ridge, N.J., assignors to Life Savers, Inc., New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,162

Int. Cl.² A23G *3/30*

U.S. Cl. 426—3 **15 Claims**

1. A flavored chewing gum having a prolonged sweet taste comprising chalk-containing gum base, and from about 0.02 to about 2.5% by weight of a particulate slowly extractable or poorly water-soluble sweetener coated with an edible coating agent dispersed in said chalk containing gum base, said particulate poorly water-soluble sweetener comprising free saccharin acid or free cyclamic acid.

4,065,580

LIPOLYTIC ENZYME FLAVORING SYSTEM

Louis I. Feldman, Morton Grove, and J. Gordon Dooley, Glenview, both of Ill., assignors to GB Fermentation Industries, Inc., Kingstree, S.C.

Continuation of Ser. No. 458,737, April 8, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,605

Int. Cl.² A23D *5/00*; A23C *19/00*; C07G *7/02*

U.S. Cl. 426—33 **21 Claims**

1. A method for producing a lipolytic enzyme system having esterase and lipase activity in a ratio of from 1 part of lipase activity to from 1 to about 10 parts of said esterase activity, said method comprising culturing *Mucor miehei* on a nutrient medium and recovering said lipolytic enzyme system substantially free of *Mucor miehei rennet* activity.

4,065,581

BUNS WHICH HAVE CENTRALLY-LOCATED RECESSES

Theodore B. Heiderpriem, 4225 1/2 Ravenwood, Pine Lawn, Mo. 63121

Continuation of Ser. No. 411,098, Oct. 30, 1973, abandoned, which is a division of Ser. No. 276,746, July 1, 1972, abandoned. This application July 17, 1975, Ser. No. 596,841

Int. Cl.² A21D *8/06, 13/00*

U.S. Cl. 426—138 **6 Claims**

1. The process of making a centrally recessed bun from a layer of initially flat yeast-raised dough, comprising laying the dough layer on a support of heat-resistant material, a surface of which is displaced in an upward direction from the support and with a recess of semi-circular cross section which is displaced in the downward direction from the said support and which extends around, and extends laterally outwardly relative to the said surface, with an inclined wall which extends upwardly from the inner periphery of said recess to the periphery of said surface, permitting the layer of so-placed dough to airproof itself whereby, in the proofed state, the layer is thicker and the peripheral edge thereof largely fills and contacts the recess and assumes the semi-circular cross section of said recess, with the proofed layer of yeast-raised dough receiving on one side thereof full support from said surface, said recess, and said inclined wall, during and subsequent to the proofing thereof, and being in contact with said surfaces, and baking the so-supported and proofed dough, to form a bun which has a centrally located recess defined by an upwardly and outwardly inclined wall with a gently rounded upper edge, and with those external surfaces of the bun unrestrictedly exposed to the air during proofing and baking having a crust of lower porosity than that of the other surfaces, with the other surfaces thereof and the inner bun material having higher porosity, whereby said bun is adapted to absorb materials of substantial liquidity through and in said higher porosity portions, while substantially preventing passage thereof through the external surfaces of substantially lower porosity resulting from the air proofing and subsequent baking of the exposed areas of said layer.

4,065,582

FRUIT PEELING METHOD

John Webb, Clearwater, and Alan Houghton, Dunedin, both of Fla., assignors to Webbs Machine Design, Clearwater, Fla.

Division of Ser. No. 526,331, Nov. 22, 1974, Pat. No. 3,982,482.
This application June 7, 1976, Ser. No. 693,226
Int. Cl.[2] A23L *1/212*
U.S. Cl. 426—231 11 Claims

1. A method of peeling fruit having a peel and an edible interior portion comprising the steps of:

penetrating an electrically conductive element into said interior portion;

applying a cutter blade to the peel of said fruit;

moving said blade inward into said fruit and rotating said fruit during blade movement to cause said blade to cut into and remove said peel;

applying an A.C. electrical signal between said blade and said conductive means so that current flows through said fruit;

detecting the impedance between said blade and conductive element to determine when said blade has penetrated to said edible interior portion; and

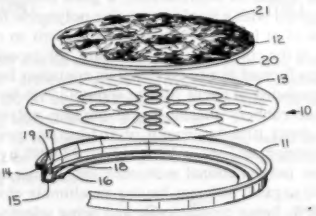
moving said blade outward upon determining that the edible portion has been penetrated.

4,065,583

METHOD OF COOKING AN ITEM OF FOOD, USING A FOOD SHEET AND AN OPEN BOTTOMED PAN

David William Ahlgren, Duluth, Minn., assignor to Jeno F. Paulucci, Duluth, Minn.

Filed May 19, 1976, Ser. No. 687,926
Int. Cl.[2] A21D *8/06*
U.S. Cl. 426—243 4 Claims



1. A method of cooking an item of food comprising the steps of:

a. providing an initially flat sheet of soft metal wrapping foil, said foil sheet being manually flexible and having a perforated central portion atop which an item of food may be placed;

b. providing an open-bottomed rigid pan of lesser size than the foil sheet, said pan being provided with an annular inner bottom rim for supporting the foil sheet and an item of food upon the foil sheet, and an outer upright peripheral flange for positioning a food item upon the annular inner rim;

c. providing an item of food to be cooked while on the foil and in the pan, said item of food having a bottom made of bread;

d. placing both the foil sheet and the item of food atop of and on the pan with the bread bottom of the food item being placed against the perforated central portion of the foil sheet;

e. pushing the food item and the foil sheet down into the pan; while simultaneously

f. wiping a margin of the foil sheet against the outer flange of the pan and simultaneously forming an outer portion of the foil sheet margin upwardly about and around the food item so that there is an upright margin flange between the food item and the pan outer flange; then

g. placing the pan, foil sheet and food item together as a package into an oven;

h. applying infra-red radiant heat upwardly through the perforations of the foil sheet and directly against at least part of the bread bottom of the food item; and

i. browning a portion of the bread bottom while cooking the food item; then

j. discharging the package from the oven after cooking the food to an extent required to prepare it for consumption; and then simultaneously

k. removing the foil sheet and the food item from the pan.

4,065,584

SULPHUR CONTAINING ARYLAMINE DERIVATIVES

Victor Lafon, Paris, France

Filed Sept. 29, 1975, Ser. No. 617,664
Claims priority, application United Kingdom, Sept. 30, 1974, 42387/74
Int. Cl.[2] A01N *9/20, 9/24;* C07C *87/02*
U.S. Cl. 424—316 2 Claims

1. A therapeutic composition comprising an anorectically effective amount of 2-phenylsulphinyl-1-diethylaminoethane citrate in association with a physiologically acceptable excipient.

2. A therapeutic composition comprising an anorectically effective amount of 2-phenylsulphinyl-1-dimethylaminopropane hydrochloride in association with a physiologically acceptable excipient.

4,065,585

RENEWABLE CHOW FUSER COATING

Raymond L. Jelfo, Lewisville, Tex.; Stephen Strella, Pittsford, and Willard C. Hamilton, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 487,937, July 12, 1974, Pat. No. 3,934,547.
This application July 30, 1975, Ser. No. 600,333
Int. Cl.[2] B05D *3/12;* G03G *13/20*
U.S. Cl. 427—11 5 Claims

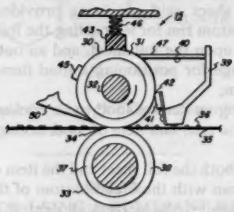
1. The method of fusing toner images to support sheets as part of the process of making xerographic reproductions by means of a xerographic reproduction apparatus including the steps of:

rotating a heated thermally conductive core which core is rotatably supported in said reproduction apparatus;

contacting said heated thermally conductive core with a solid low surface energy coating material to form a thin solid coating layer thereon;

subsequently applying a low viscosity liquid release agent to said layer; and

passing said support sheets having said toner images adhered thereto into contact with said heated core having said solid coating layer and said release agent thereon such that



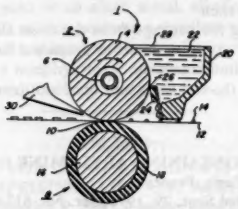
said toner images contact said release agent and simultaneously applying pressure to said toner images while contacting said heated thermally conductive core with said coating material.

4,065,586

FIXING METHOD USING POLYARYLSILOXANES AS RELEASE AGENTS

Clifford O. Eddy, and Thomas R. Hoffend, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 1, 1976, Ser. No. 662,658
Int. Cl.[2] G03G *13/20*
U.S. Cl. 427—22 **20 Claims**



1. The method of fusing electroscopic toner images to a substrate including the steps of:

a. forming a film on a heated metal fuser member in an electrostatic reproducing apparatus, said film being a barrier to electroscopic toner and comprising the product resulting from the interaction of the fuser member and a polyarylsiloxane having at least about 0.5 aryl group or substituted aryl group per molecule which interacts with the fuser member surface, said polyarylsiloxane being fluid at the temperature of the fuser member and acting as a release fluid film for the electroscopic toner;

b. contacting the toner images on said substrate with the coated, heated fuser member for a period of time sufficient to soften the electroscopic toner; and

c. allowing the toner to cool.

4,065,587

U.V. CURABLE POLY(ETHER-URETHANE) POLYACRYLATES AND WET-LOOK POLYMERS PREPARED THEREFROM

Vincent Wen-Hwa Ting, Brunswick, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed May 11, 1976, Ser. No. 685,374
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—54 **16 Claims**

1. A poly(ether-urethane)polyacrylate polymer comprising the product obtained by reacting a polyurethane intermediate having 4 to 10 terminally-positioned reactive isocyanate groups with 4 to 10 molar equivalents of a hydroxy (lower) acrylate or methacrylate, said intermediate resulting from the reaction of 1 to 7 moles of a polyether diol having a molecular weight in the range of 100 to 10,000; 2 to 8 moles of a monomer polyol having 3 to 12 carbon atoms and at least 3 reactive hydroxyl groups; and 6 to 24 moles of an organic diisocyanate.

9. A process for imparting a wet look coating to a substrate which comprises:

a. forming a radiation curable composition comprising on a weight percent basis:
   i. 30 to 70 percent of a poly(ether-urethane) polymer of claim **1**:
   ii. 10 to 40 percent of a monofunctional acrylate monomer
   iii. 5 to 50 percent of a multifunctional acrylate cross-linking agent; and
   iv. 3 to 5 percent of a photosensitizer; said composition totaling 100 percent;

b. applying said mixture as a 0.1 to 10 mil thick coating to a substrate selected from the group consisting of flat stock metal, wood, fiberboard and floor tile; and

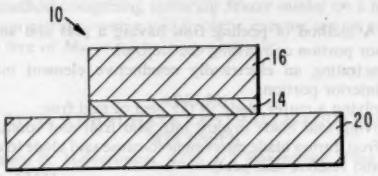
c. curing said coating substrate in air at ambient temperature by passing the substrate at a rate of from 10 to 1000 foot/-minute through an effective field of ultraviolet radiation.

4,065,588

METHOD OF MAKING GOLD-COBALT CONTACT FOR SILICON DEVICES

Anthony Francis Arnold, Ringoes, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 20, 1975, Ser. No. 633,696
Int. Cl.[2] H01L *29/46;* B32B *15/04;* H01L *21/283*
U.S. Cl. 427—89 **2 Claims**



1. A method of making a contact to a silicon body comprising:

depositing a layer of gold directly on said silicon body;

depositing a layer of cobalt directly on said layer of gold without intermediate exposure to oxygen; and

heating said deposited silicon body to a temperature between about 300° and about 370° C in a reducing atmosphere.

4,065,589

POLYMERIC COATING FOR PROTECTION OF GLASS SUBSTRATE

William Lenard, Temperance, Mich., and Lynn J. Taylor, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed June 9, 1975, Ser. No. 585,111
Int. Cl.[2] B65D *11/16*
U.S. Cl. 428—35 **3 Claims**

1. As an article of manufacture, a glass container at least partially coated with a single protective polymeric film having a thickness of at least **0.002** inch and sufficient to resist glass shattering of the container under pressure, the crosslinked film having been formed in situ on the glass container from a composition consisting of about 70% to about 98.99% by weight of at least one rubbery thermoplastic organic polymer, about 0.01% to about 10% by weight of at least one peroxidic organic compound, and about 1% to about 29.99% by weight of at least one polyfunctional monomer; said polymer being an elastomeric organic polymer having an ultimate elongation of at least **100**%, being crosslinkable and being selected from the group consisting of ethylene-vinyl acetate copolymers, hydrolyzed ethylene-vinyl acetate copolymers, ethylene-ethyl acrylate copolymers, ethylene-acrylic acid copolymers and their salts, ethylene-propylene copolymers, styrene-butadiene copolymers including both block and random copolymers, sty-

rene-isoprene copolymers, acrylonitrile-butadiene copolymers, isobutylene-isoprene copolymers, polyurethane thermoplastic polyesters, ethylene-propylene-diene terpolymers, styrene-ethylene-butylene block terpolymers, polypentenamers, and

polyamides derived from a dimer acid; said peroxidic organic compound possessing at least one oxygen-oxygen bond; and said polyfunctional monomer being a polymerizable ethylenically unsaturated monomer having a functionality of at least two.

4,065,590

ETHYLENE COPOLYMER GLASS BOTTLE COATING

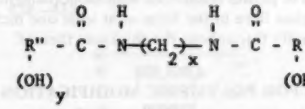
George Anthony Salensky, Metuchen, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 13, 1976, Ser. No. 732,128
Int. Cl.[2] B05D *1/24, 3/02*
U.S. Cl. 428—35 **12 Claims**

1. An article of manufacture comprising a glass bottle having its outer surface coated with a clear continuous layer of a blend of:

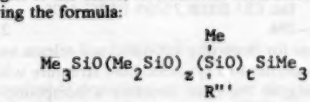
A. about 80 to about 99 percent by weight, based on the total weight of the blend, of a random, normally solid ethylene copolymer selected from the group consisting of normally solid ethylene/acrylic acid copolymers, ethylene/methacrylic acid copolymers and copolymers having 10% to 90% weight of the carboxylic acid groups of said ethylene/acrylic or ethylene/methacrylic acid copolymers ionized by neutralization with metal ions having an ionized valence of one to three inclusive, wherein said random ethylene copolymers contain from about 8 to about 25 percent by weight of acrylic or methacrylic acid copolymerized therein;

B. about 0.5 to about 3 weight percent, based on the total weight of the blend, of an anti-caking agent selected from the class consisting of saturated fatty acid amides having about 10 to about 22 carbon atoms, monohydroxy substituted saturated fatty acid amides having about 10 to about 22 carbon atoms or alkylene bis-saturated fatty acid amides having the general formula:



wherein x is an integer having values of 0 to about 12, R' and R'' are each aliphatic hydrocarbon residues having about 10 to about 22 carbon atoms and y is an integer having values of 0 to 2 inclusive;

C. about 0.1 to about 1 percent by weight, based on the total weight of the blend, of a silicone fluid lubricity additive having the formula:



wherein Me is methyl, z is an integer having an average value of about 6 to about 40, t is an integer having an average value of about 3 to about 40, and r''' is a monovalent group selected from the class consisting of —C_2H_4-phenyl and alkyls having about 18 to about 22 carbon atoms; and

D. 0 to about 16 weight percent, based on the total weight of the blend, of an adhesion modifier selected from the class consisting of polyethylene glycols having a molecular weight of about 190–6000, monomethyl ethers of polyethylene glycols having a molecular weight of about 550–5000, and magnesium oxide having a particle size of less than about 0.1 micron and a surface area of greater than about 50 square meters per gram.

4,065,591

PITCH IMPREGNATED ARTICLES AND PROCESS FOR MAKING SAME

Charles R. Gannon, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 390,670, Aug. 22, 1973, Pat. No. 3,953,628.
This application Jan. 16, 1976, Ser. No. 649,751
Int. Cl.[2] F16L *9/14;* **B05D** *1/18*
U.S. Cl. 428—36 **12 Claims**

10. An impregnated pipe having a metallic colored surface comprising;

a. a porous tubular body;

b. a solidified pitch selected from the group consisting of coal tar pitch, oxidized petroleum pitch, unoxidized petroleum pitch and mixtures thereof at least partially permeating into the porous spaces of said tubular body, and forming a film of pitch over at least a portion of the tubular body surface; and

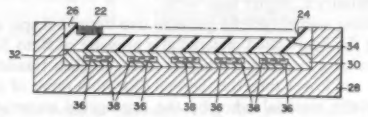
c. stearic acid and aluminum pigment previously milled in the presence of stearic acid contained within said film of pitch, the ratio of stearic acid to pigment being between about 4 and and about 30 parts by weight per 100 parts by weight of metallic pigment.

4,065,592

SOLAR ENERGY ABSORBER

Patrick Von McAllister, Salt Lake City, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 14, 1976, Ser. No. 677,091
Int. Cl.[2] B32B *3/02*
U.S. Cl. 428—92 **9 Claims**



1. A solar energy absorber comprising a multiplicity of nonmetallic fibers, stable in air at temperatures of up to about 500° F., said fibers being substantially straight and aligned in a parallel and side-by-side relationship, substantially all of said fibers having at least one free end, said fibers having diameters of from about 4 micrometers to about 100 micrometers, said fibers being spaced apart such that the distance between adjacent fibers is from about 1 micrometer to about 10 micrometers, the free ends of the fibers being tapered and the free ends of said tapered fibers being coated with a material having an emissivity of less than about 0.05, said coated free ends of the fibers comprising the solar energy absorbing surface.

4,065,593

SOLAR ENERGY ABSORBER

Albert Henry Peterson, Sandy, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 14, 1976, Ser. No. 677,093
Int. Cl.[2] B32B *3/02*
U.S. Cl. 428—92 **3 Claims**

1. A solar energy absorber comprising a multiplicity of carbon fibers, said carbon fibers having diameters of from about 4 micrometers to about 12 micrometers, said fibers being substantially straight and aligned in parallel and side-by-side

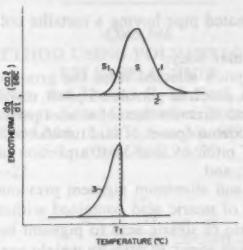
relationship, substantially all of said fibers having at least one free end, the free ends of said fibers comprising the solar en-

ergy absorbing surface, said fibers being spaced apart such that the distance between adjacent fibers is from about 1 micrometer to about 20 micrometers.

4,065,594
METHOD OF SHAPING ORIENTED MATERIALS OF POLYOLEFIN

Hikaru Shii, and Eisuke Oda, both of Yokohama, Japan, assignors to The Furukawa Electric Co. Ltd., Tokyo, Japan

Filed May 15, 1974, Ser. No. 470,020
Claims priority, application Japan, May 21, 1973, 48-55584
Int. Cl.[2] B29D *7/14*
U.S. Cl. 428—113 **15 Claims**



1. A method of manufacturing shaped articles of polyolefin oriented materials which comprises:

providing oriented filmy or fibrous raw polyolefin material satisfying the following requirements:

a. K determined from a melting curve by differential scanning calorimetry smaller than 60%,

b. long period L determined from small angle X-ray scattering intensity larger than 500A, and

c. crystallinity C higher than 80%,

aggregating said polyolefin material into desired shape, and

pressing the aggregated material at a pressure of 50 to 1000 kg/cm^2 at a temperature higher than the glass transition point and lower than the thermal distortion point of said polyolefin material whereby the aggregated material is formed into an integral mass simply by the effect of the applied pressure and without use of adhesive.

5. Shaped polyolefin products formed substantially by the method set forth in claim 1.

4,065,595
THERMOGRAPHIC STENCIL SHEET AND METHOD OF MAKING AN IMAGED STENCIL SHEET

Margery L. Schick, Mount Prospect, and Bror E. Anderson, Arlington Heights, both of Ill., assignors to Weber Marking Systems, Inc., Arlington Heights, Ill.

Filed Nov. 5, 1974, Ser. No. 521,034
Int. Cl.[2] G03G *5/022*
U.S. Cl. 428—141 **2 Claims**

1. A thermographic stencil sheet adapted to be disposed in imaging contact with an original on one side thereof, which comprises:

an ink-pervious fibrous stencil base tissue sheet having a weight of about 4½ to 12 lbs. per 3,000 sq. ft.,

a first layer of a heat-flowable composition provided on the tissue sheet by deposition of the composition on the tissue sheet from a volatile solvent solution thereof and removing the solvent therefrom by drying until at least about dry to the touch, said first layer when dry having external surfaces which are uneven due to the unevenness of the underlying tissue sheet, and

a second layer of a heat-flowable composition provided on said first layer by deposition of the composition on the first layer from a volatile solvent solution thereof and removing solvent therefrom by drying, said second layer filling the low areas on one surface of said first layer and providing an even surface on the resulting stencil sheet for intimate contact with an original,

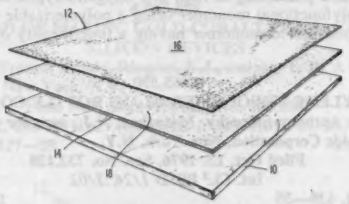
said heat-flowable composition for each layer including a thermoplastic film-forming material comprising a cellulose organic ester, and plasticizing material partially but incompletely compatible with the film-forming material,

said layers providing an ink-impervious coating on the tissue sheet.

4,065,596
ARTIST'S BOARD

James Groody, 281-1 Windybush Road, R.D. No. 2, New Hope, Pa. 18938

Filed Apr. 22, 1976, Ser. No. 679,182
Int. Cl.[2] B32B *7/02*
U.S. Cl. 428—215 **4 Claims**



1. A laminated artist's board comprising a rear substantially rigid stiffener member, a front member of fibrous material consisting of paper, cotton duck or linen, said fibrous material having a plastic paintable surface thereon consisting of polyethylene, polypropylene, acrylic, vinyl or epoxy resins and an intermediate flexibly resilient member consisting of rubber, vulcanizates of acrylic elastomers or foamed plastic, the combined hardness of the front and intermediate members being such that the application of a paint brush to the paintable surface will be cushioned and indent the surface but the indentation will recover substantially instantaneously.

4,065,597
FIBRE-REINFORCED LAMINATES

David L. Gillespie, Grovers Farm, Dippenhall, Farnham, Surrey, England

Filed June 17, 1975, Ser. No. 587,697
Claims priority, application United Kingdom, June 26, 1974, 28465/74
Int. Cl.[2] C04B *31/06*
U.S. Cl. 428—285 **14 Claims**

1. A lamina of plaster reinforced with monofilament, continuous strand glass fibre in the form of at least one mat distributed substantially throughout the thickness thereof.

4,065,598
PROCESS FOR POLYMERIC MODIFICATION OF A FIBER

Kooji Takahashi, Otsu; Tatsuji Kojima, Kyoto; Teruo Ishikawa, Otsu; Kimio Nakamura, Otsu, and Shizuyoshi Ikenaga, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 559,176, March 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 279,322, Aug. 10, 1972. This application Mar. 15, 1977, Ser. No. 777,655
Int. Cl.[2] B32B *27/00*; D02G *3/00*
U.S. Cl. 428—394 **33 Claims**

1. A process for imparting antistatic, soil release and water-absorbing properties to a synthetic fiber structure which comprises adhering to the fiber structure a compound selected from the group consisting of diacrylate, dimethacrylate, triacrylate and trimethacrylate compound having a polyalkylene oxide segment which has a molecular weight of from 400 to

10,000 and which includes an alkylene substituent selected from the group consisting of ethylene groups, propylene groups and a mixture of ethylene groups and propylene groups, and after such adhesion heat-treating the adhered compound and fiber structure in the presence of moisture, whereby polymerization of said compound is carried out on the fiber to form a uniform and smooth film having a thickness of about 0.01 –10μ and the surface of the fiber is covered by said polymer film of said compound.

4,065,599

SPHERICAL OBJECT USEFUL AS FILLER MATERIAL

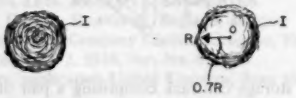
Shiro Nishiumi; Shoichi Hasegawa, both of Otsu; Toshiyuki Mizoguchi, Osaka, and Sachiko Furuta, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 324,142, Jan. 16, 1973, abandoned. This application Nov. 18, 1975, Ser. No. 633,077

Claims priority, application Japan, Jan. 19, 1972, 47-6884; Jan. 25, 1972, 47-8719

Int. Cl.² B32B *27/02*

U.S. Cl. 428—402 **8 Claims**



1. A spherical object useful as a filler material having a round cross-section having a diameter of from 5 to 50 mm, said object having a surface shell composed of a plurality of arcuately arranged synthetic organic polymeric filaments of at least 0.2 m in length and between 2 and 20 denier in fineness being concentrated near the surface of said spherical object to form an outer portion near the surface of said spherical object, and said spherical object having a less dense inner portion and an average bulk density of between 1 and 30 mg/cm³, said filaments being arranged along different arcuate paths which are angularly related to each other such that different filaments intersect with one another at different points relative to the surface of said object, said filaments being adhesively fixed to each other at the points of intersection.

7. A quilting or cushioning article composed of a multiplicity of spherical objects as recited in claim 1, filled in said article.

4,065,600

METAL OXIDE FILMS

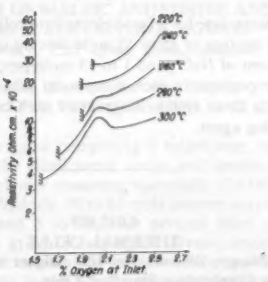
Robert David King, Solihull; Robert Hiscutt, and Peter Molineux, both of Birmingham, all of England, assignors to Triplex Safety Glass Company Limited, London, England

Filed May 18, 1971, Ser. No. 144,541

Claims priority, application United Kingdom, May 20, 1970, 24510/70

Int. Cl.² C01C *15/00*

U.S. Cl. 428—432 **42 Claims**



1. A method of depositing a transparent electrically conductive metal oxide coating by reactive sputtering onto the surface of a substrate, wherein: the substrate is supported, in spaced relationship with a cathode which is to be sputtered, in a vacuum chamber containing an atmosphere comprising an inert gas and a controlled oxygen concentration at a selected reduced total pressure, the substrate is heated prior to sputtering to a selected elevated temperature, and reactive sputtering is caused by applying a selected negative potential to the cathode relative to the substrate, the oxygen in the atmosphere being provided and maintained at a selected concentration, and the heating of said substrate being controlled during sputtering to maintain said substrate temperature substantially constant at said selected temperature during heating of said substrate caused by sputtering, the selected values of the oxygen concentration, substrate temperature, vacuum chamber pressure, and cathode potential being so chosen that the deposited coating is haze-free, and its specific electrical resistivity lies at or close to the minimum of the curve which is obtained by plotting specific electrical resistivity against oxygen concentration while maintaining the substrate temperature, vacuum chamber pressure and cathode potential all constant at said selected values.

22. An article with a transparent and haze-free, electrically conductive metal oxide coating having a specific electrical resistivity below 20×10^{-4} ohm. cm. applied thereon by a process according to claim 1.

4,065,601

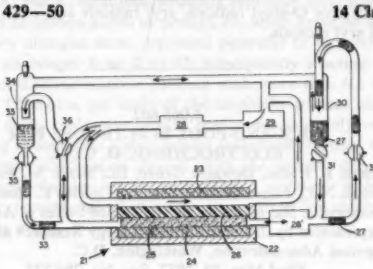
TWO PHASE ELECTROLYTES USED AS HALOGEN TRAPS IN METAL HALOGEN SECONDARY CELLS AND BATTERIES

Alfred M. Ajami, Boston; Fraser M. Walsh, Arlington, and Dennis N. Crouse, Melrose, all of Mass., assignors to Eco-Control, Inc., Cambridge, Mass.

Filed Sept. 14, 1976, Ser. No. 723,142

Int. Cl.² H01M *10/44*

U.S. Cl. 429—50 **14 Claims**

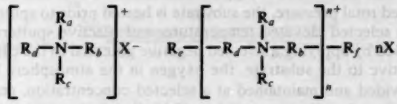


1. A method for improving the performance of current delivering electrochemical systems of the type which utilize a halogen selected from the group consisting of bromine, chlorine, iodine, and mixtures thereof as an electrochemically active agent which reacts electrochemically at a halide electrode and which system includes a metal electrode and an aqueous metal halide electrolyte phase in which halogens are soluble, wherein the improvement comprises using an organic halogen complexing phase which has two components, one of which is an organic solvent which is insoluble in water, the second component being an organic salt which is soluble in the organic solvent, forms complexes with halogens which do not crystallize out of the solvent at any point during halogen addition, and which do not react irreversibly with free halogens, the organic halogen complexing phase remaining insoluble with the aqueous electrolyte phase during charging and discharging of the current delivery system, the organic salt of the halogen complexing phase forming a reversible complex with the halogen to store halogen during charging of the system and to release halogen during discharging of the system, the halogen complexing phase preventing halogens from dissolving in the aqueous phase.

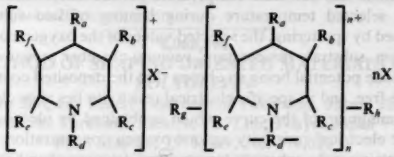
6. The method as set forth in claim 1 wherein said organic salt is a salt selected from the group consisting of:

Ammonium salts having the formula:

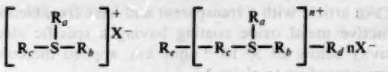
-continued



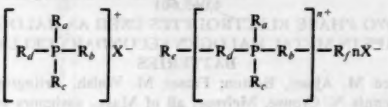
Pyridinium salts having the formula:



Sulfonium salts having the formula:



Phosphonium salts having the formula:



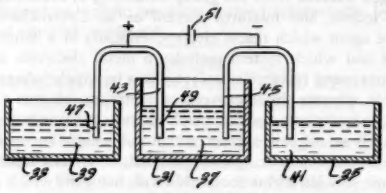
where all R's may be but need not be equal and R's may be hydrogens, alphatic radicals, O-alkyl radicals, functionalized aliphatic or O-alkyl radicals, aryl radicals and/or functionalized aryl radicals.

4,065,602

WICK-AND-POOL ELECTRODES FOR ELECTROCHEMICAL CELL

Michael F. Roche, Downers Grove, Ill.; Suzan M. Faist, Norwood, N.J.; James G. Eberhart, and Laurids E. Ross, both of Naperville, Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 24, 1977, Ser. No. 780,722
Int. Cl.² H01M *10/39*
U.S. Cl. 429—72 **9 Claims**



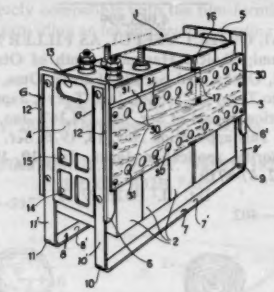
1. A liquid-metal electrode system for providing electrode reactant into an electrode within an electrochemical cell also including a second electrode of opposite polarity, said system comprising a cell structure containing a volume of liquid electrolyte, a reservoir containing said liquid metal outside said volume of liquid electrolyte, a wick having a first portion of its length in contact with said liquid metal within said reservoir, and having a second portion of its length opposite to said first portion submerged within said volume of electrolyte, said wick having sufficiently more attraction for said liquid metal than for said electrolyte to draw said liquid metal into said second portion submerged within said electrolyte.

4,065,603

RACK FOR A STORAGE BATTERY

Jean Colbion, Tresses, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Feb. 22, 1977, Ser. No. 770,630
Claims priority, application France, Mar. 9, 1976, 76.06705
Int. Cl.² H01M *2/10*
U.S. Cl. 429—99 **10 Claims**



1. A storage cell rack comprising a pair of insulative end plates, at least two insulative longerons interconnecting said end plates, means for fastening the longerons to the end plates, said longerons having storage cell supporting hollows, a stand comprising two metal bars extending parallel to the longerons for supporting an assembly of end plates and longerons, each bar having is ends upturned to constitute uprights, and means fastening the said ends to respective ones of the end plates.

4,065,604

THERMAL CELLS AND ELECTROLYTE COMPOSITION THEREFOR

Glenn F. Zellhoefer, Normal, Ill., assignor to National Union Electric Corporation, Stamford, Conn.

Filed Jan. 27, 1954, Ser. No. 406,543
Int. Cl.² H01M *6/30, 6/18*
U.S. Cl. 429—103 **10 Claims**

PERCENTAGE COMPOSITION BY WEIGHT			
POINT NO.	$CaCl_2$	NaCl	KCl
1	48.0	19.5	12.5
2	69.8	29.4	0.8
3	60.7	38.4	0.9
4	59.1	27.7	13.2
5	67.2	26.0	6.8
6	67.7	28.9	3.4
7	65.0	31.5	3.5
8	64.5	28.6	6.9

1. An electrolyte for a fused electrolyte cell consisting essentially of a mixture of 45 to 55 mole percent of $CaCl_2$; 30 to 54 mole percent of NaCl; and 1 to 15 mole percent of KCl, containing proportions of each component substantially as determined by a three system diagram of such conponents; and a depolarizing agent.

4,065,605

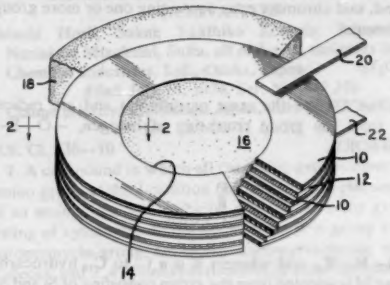
THERMAL CELLS

John H. Zauner, Bloomington, Ill., assignor to National Union Electric Corporation, Stamford, Conn.

Filed Jan. 27, 1954, Ser. No. 406,607
Int. Cl.² H01M *6/36*
U.S. Cl. 429—112 **6 Claims**

1. Thermal cell construction comprising a stack of annular

bimetal disks separated from each other by dry electrolyte, and a mass of heat source material in the cavity formed by said



stack and arranged in intimate contact with said bimetal disks, said disks constituting the electrodes of said cell.

4,065,606

ELECTRIC RESERVE BATTERIES

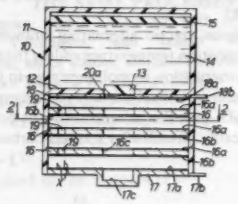
William Ernest Casson, Emsworth, England, assignor to The McMurdo Instrument Company Limited, Croydon, England

Filed June 2, 1976, Ser. No. 691,991

Claims priority, application United Kingdom, June 10, 1975, 24884/75

Int. Cl.² H01M *6/04*

U.S. Cl. 429—198 **4 Claims**



1. As a reserve battery electrolyte, an electrolyte solution selected from the group consisting of perchloric acid, fluoboric acid, fluorsilicic acid and nitric acid, said solution having added thereto as an accretion growth inhibitor, from 0.05 to 5.0 weight percent of a levelling agent selected from the group consisting of gelatine, peptone, phenol, hydroquinone, 1,4 naphthoquinone, 1-naphthol-4-hydroxy anthroquinone, 1-amino-1-naphthol-3-sulphonic acid, eugenol, lignin-sulphuric acids, dimethyl aniline, dibenzene sulpho-amide, allantoin, resorcinal, coumarin, 1,4 naphthol sulphonic acid, urea and glycine.

4,065,607

TERPOLYMERS OF MALEIC ANHYDRIDE AND THEIR USE AS SCALE CONTROL AGENTS

Stephen R. Kurowsky, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Mar. 23, 1977, Ser. No. 780,483

Int. Cl.² C08F *22/00*; C08C *19/00*; C08F *34/02, 222/04*

U.S. Cl. 526—15 **12 Claims**

1. A polymeric agent comprising a terpolymer, its hydrolyzed form, and the alkali metal, amine and ammonium salts thereof, said terpolymer consisting essentially of 30 to 55 mole percent maleic anhydride, 30 to 65 mole percent acrylamide or methacrylamide and 5 to 15 mole percent third monomer selected from the group consisting of styrene, α-methyl styrene, alkyl acrylate or alkyl methacrylate having from one to eight carbon atoms in the alkyl group and 1-alkene having from four to ten carbon atoms, said terpolymer being characterized by a relative viscosity of about 1.02 to 1.10 in dimethyl sulfoxide at a concentration of 0.5 g. per deciliter, and by solubility of less than 0.10 g. per g. of solution (water) at ambient temperature.

4,065,608

PROCESS FOR THE PREPARATION OF CATIONIC PAPER SIZING AGENTS

Heinz Beck, Duren; Gerhard Gabriel, Nideggen, and Gunter Poppel, Duren-Niederau, all of Germany, assignors to Akzona Incorporated, Asheville, N.C.

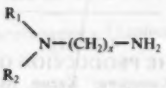
Filed Oct. 6, 1976, Ser. No. 730,032

Claims priority, application Germany, Oct. 8, 1975, 2544948

Int. Cl.² C08F *8/32, 8/02*

U.S. Cl. 526—49 **15 Claims**

1. A process for preparing cationic paper sizing agents comprising first reacting in an organic solvent a copolymer of maleic anhydride and an α-olefin containing 10 to 26 carbon atoms, said copolymer having a molar ratio of maleic anhydride to α-olefin of from 0.9:1 to 1.8:1, with from 0.1 to 1.0 mole per mole of anhydride, of a monoprimary/monotertiary alkylene diamine of the formula,



wherein R_1 and R_2 each independently represent alkyl having from 1 to 22 carbon atoms or phenyl, or, when grouped with the tertiary nitrogen atom, represent piperidyl or morpholyl, and x is an integer from 2 to 12; subsequently reacting the copolymer-diamine reaction product with more than 0.2 and less than 1.5 moles, per mole of the originally present anhydride, of a low-molecular weight polyamine, said polyamine containing at least two amino groups which are primary, secondary, or a combination thereof, with the proviso that the total amount of amine reacted be less than 2 moles per mole of originally present anhydride; and converting the resultant product to a salt.

4,065,609

POLYMERIZATION PROCESS

Bruce Albert Edward Willmore, Cockernhoe, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 1, 1976, Ser. No. 672,603

Claims priority, application United Kingdom, Apr. 17, 1975, 15863/75

Int. Cl.² C08F *2/34, 4/60, 10/00*

U.S. Cl. 526—61 **11 Claims**

1. A process for the production of a solid polymer which comprises:

contacting at least one gaseous mono-α-olefine monomer with a solid polymer of said monomer or monomers, in the presence of a transition metal catalyst,

stirring the solid polymer to effect agitation, and

maintaining the conditions of temperature and pressure of the reaction to be such that the reaction temperature is in the range from $(t_P + 0.1)°$ C up to $(t_P + 5.0)°$ C, and the partial pressure of one of said monomers is P psig, wherein P psig is the saturated vapour pressure of said monomer at a temperature of $t_P°$ C.

4,065,610

TREATMENT OF CONTAMINATED HYDROCARBON FROM OLEFIN POLYMERIZATION

Jan W. De Beukelaar, Amsterdam; Henry Van Zwet, The Hague, and Jacob B. Roest, Amsterdam, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 12, 1976, Ser. No. 731,593

Claims priority, application United Kingdom, Oct. 14, 1975, 41990/75

Int. Cl.[2] C08F *6/00, 10/00, 10/06*

U.S. Cl. 526—70 **7 Claims**

1. In a process for the polymerization of 1-olefins by contact with a catalyst comprising $TiCl_3$ and an organo aluminum compound, wherein the crude olefin polymer is de-ashed by contact with a titaniumsolubilizing composition and the polymer or polymer-containing slurry, recovered from the de-ashing step, is washed with a predominantly hydrocarbon liquid to produce clean polymer which is separated from the dirty wash liquid which contains solubilized catalyst residue, and wherein the resulting dirty wash liquid is separately recovered, the improvement which comprises recovering purified hydrocarbon wash liquid components suitable for recycle to the polymerization reaction, by treating the dirty wash liquid in the presence of dissolved monohydric alcohol with a dissolved glydicyl compound which has a boiling temperature higher than that of said wash liquid and recovering by distillation at least one purified hydrocarbon component from the treated wash liquid.

4,065,611

PROCESS FOR THE PRODUCTION OF POLYOLEFINS

Mituji Miyoshi, Kanagawa; Kazuo Matsuura, Kawasaki; Nobuyuki Kuroda, and Shiro Ogawa, both of Yokohama, all of Japan, assignors to Nippon Oil Company Limited, Tokyo, Japan

Continuation of Ser. No. 377,056, July 6, 1973, abandoned. This application Sept. 10, 1976, Ser. No. 722,859

Claims priority, application Japan, July 8, 1972, 47-67907

Int. Cl.[2] C08F *4/02, 10/02*

U.S. Cl. 526—124 **13 Claims**

1. A process for the production of polyolefins which comprises polymerizing at least one alpha-olefin having 2 to 6 carbon atoms in the presence of a composite catalyst consisting of:

a. a solid catalyst component resulting from contacting magnesium oxide with an organic halide selected from the group consisting of tertiary butylchloride, tertiary butylbromide, and tertiary hexylchloride, in amounts not exceeding 10 millimols per gram of said magnesium oxide in the presence of solvents inert to Ziegler catalysts at 0° - 200° C, admixing said contacted magnesium oxide with a transition metal halide selected from the group consisting of titanium and vanadium halides in amounts of 0.1 to 50 times by weight of said magnesium oxide that are liquid at the following reaction temperature, and reacting said admixture at 50° - 200° C, and

b. an organometal compound selected from the group consisting of organoaluminum compounds and alkylzinc compounds.

4,065,612

PHENOL MODIFIED POLYMERIZATION CATALYST AND POLYMERIZATION PROCESS

Anthony David Hamer, Plainsboro, and Frederick John Karol, Bellemead, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,975

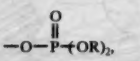
Int. Cl.[2] C08F *4/02, 10/02*

U.S. Cl. 526—130 **31 Claims**

1. In a process for polymerizing a monomer charge comprising at least a major amount of ethylene by contacting said charge with a catalyst comprising chromate ester deposited on a support comprising silica and treated with strong reducing agent, the improvement which comprises treating said catalyst, prior to said treatment with said reducing agent, with phenol compound, said chromate ester containing one or more groups of the formula

$$CrO_2Y_2$$

wherein the Y's are the same or different and are radicals selected from the group consisting of halogen, —O—R—, —O—Ti—(OR)$_3$,



and —O—M—R$_3$, and wherein R is a C_1 to C_{14} hydrocarbyl group and M is selected from the group consisting of Si and Sn.

4,065,613

ALTERNATING COPOLYMERS OF ALKYL ACRYLATE/ETHYLENE/BRANCHING AGENTS

Anestis Leonidas Logothetis, Louisville, Ky., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

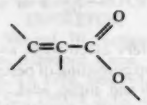
Filed Mar. 17, 1975, Ser. No. 559,169

The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.

Int. Cl.[2] C08F *18/00, 20/00, 222/00, 20/10*

U.S. Cl. 526—292 **3 Claims**

1. An amorphous atactic alternating branched copolymer having a glass transition temperature of less than 0° C obtained by addition polymerization by polymerizing in the presence of a Lewis acid and free radical initiator, said copolymer having repeating units of —A—B— wherein A is the polymerized unit of the ethylenically unsaturated carbon-carbon bond of the group



contained in a compound selected from the class consisting of:

1. ethyl acrylate,
2. ethylene glycol diacrylate,
3. maleic acid monoethyl ester, and B is the polymerized unit of the ethylenically unsaturated carbon-carbon bond of ethylene, wherein the total amount of (2) present is 0.05 t 5 mole percent; the amount of (3) present is either none or 1 to 10 mole percent; and the amount of (1) and ethylene present is complemental.

4,065,614

INTERMEDIATE AMIDE PECTINS

Denny B. Nelson, Corona, Calif., assignor to Sunkist Growers, Inc., Sherman Oaks, Calif.

Filed Jan. 13, 1976, Ser. No. 648,733

Int. Cl.[2] C08B *37/06*

U.S. Cl. 536—2 **21 Claims**

1. A pectin derivative having not more than 39% carboxyl groups, and at least 27% amide groups, with the total of said carboxyl and said amide percentages within the range from 56 to 70%; the balance being methyl ester groups and having an apparent molecular weight in excess of 110,000.

4,065,615
DEOXYAMINOGLYCOSIDE ANTIBIOTIC DERIVATIVES

Satoshi Horii, Sakai; Yukihiko Kameda, Toyonaka, and Nariakira Mizokami, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed July 10, 1974, Ser. No. 487,226
Claims priority, application Japan, July 12, 1973, 48-78979
Int. Cl.[2] C07H *15/22*
U.S. Cl. 536—10 10 Claims

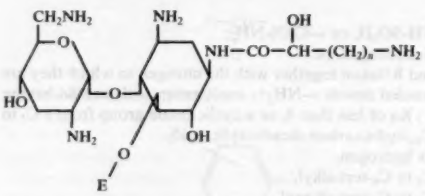
1. A compound in which all the amino groups other than the amino group at the 1-position on the deoxystreptamine moiety of an aminoglycoside antibiotic selected from the group consisting of xylostasin, ribostamycin, neomycin-group antibiotic, paromomycin-group antibiotic, kanamycin-group antibiotic, 3'-deoxy and 3',4'-dideoxyderivatives of these antibiotics, gentamicin-group antibiotic and lividomycin-group antibiotic are formylated and the amino group at the 1-position is unsubstituted.

4,065,616
PROCESSES FOR PRODUCTION OF A 1-N-(α-HYDROXY-Φ-AMINO ALKANOYL)-3-DEOXY-5-O-PENTAFURANOSYL NEAMINE AND NEW COMPOUNDS PRODUCED BY THE SAME PROCESSES

Hamao Umezawa; Sumio Umezawa, both of Tokyo; Tsutomu Tsuchiya, Yokohama, and Isamu Watanabe, Higashimurayama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 710,949
Claims priority, application Japan, Aug. 15, 1975, 50-98501
Int. Cl.[2] C07H *15/22*
U.S. Cl. 536—17 2 Claims

1. A compound of the formula (I'):



(I')

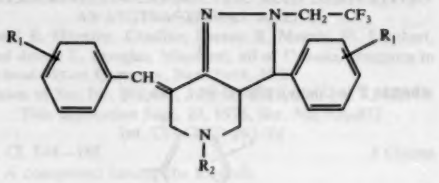
wherein E is β-D-xylofuranosyl group, α-L-arabinofuranosyl group or 5-amino-5-deoxy-β-D-xylofuranosyl group, and *n* is an integer of 1 or 2, provided that E is β-D-xylofuranosyl group when *n* is 1 and provided that E is α-L-arabinofuranosyl or 5amino-5-deoxy-β-D-xylofuranosyl group when n is 2, or a pharmaceutically acceptable acid-addition salt thereof.

4,065,617
2-(2,2,2,-TRIFLUOROETHYL)-3,3A,4,5,6,7-HEXAHYDRO-2H-PYRAZOLO[4,3-C]PYRIDINES

John Krapcho, Somerset, and Chester F. Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 4, 1977, Ser. No. 765,572
Int. Cl.[2] C07D *471/02, 471/06*
U.S. Cl. 542—450 14 Claims

1. A compound having the formula



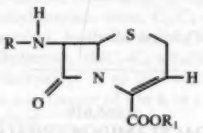
or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, chloro, fluoro, alkyl, alkoxy or trifluoromethyl; and R_2 is hydrogen, alkyl, arylalkyl, hydroxyalkyl or carboximidamide; and wherein the term aryl refers to phenyl or phenyl monosubstituted with a hydrogen, chloro, fluoro, alkyl, alkoxy or trifluoromethyl group and the terms alkyl and alkoxy refer to groups having 1 to 8 carbon atoms.

4,065,618
PROCESS FOR 3-H-3-CEPHEM ESTERS

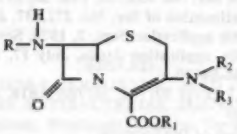
Wayne Alfred Spitzer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 576,818, May 12, 1975, Pat. No. 4,013,651.
This application Sept. 3, 1976, Ser. No. 720,179
Int. Cl.[2] C07D *501/04*
U.S. Cl. 544—16 4 Claims

1. The process for preparing a 3-cephem ester of the formula

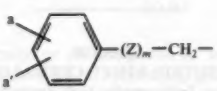


which comprises 1) reacting under anhydrous conditions a compound of the formula

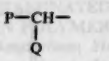


in an inert solvent at a temperature between about 5° and 35° C. with diborane, 2) acidifying the reaction mixture and 3) separating the 3-cephem ester from the acidified reaction mixture; where in the above formulas R is hydrogen or an acyl group

and R' is C_1–C_6 alkyl, C_1–C_3 cyanoalkyl, phenyl, halophenyl, methylphenyl, hydroxyphenyl, nitrophenyl, aminophenyl, or methoxyphenyl; or R' is a group of the formula



wherein *a* and *a'* are independently hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, nitro, amino, or carboxy,
Z is O or S, and *m* is O or 1;
or R' is a group of the formula



wherein P is thienyl, phenyl or

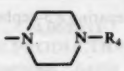
wherein *a* and *a'* are as defined above; Q is hydroxy, amino, carboxy or —SO_3H;

or R' is a group of the formula

R''-CH_2—

wherein R'' is thienyl, furyl, 2-oxazyl, 2-thiazyl, or 1-tetrazyl; R_1 is benzyl, 4-nitrobenzyl, 4-methoxybenzyl, diphenylmethyl, t-butyl or 2,2,2-trichloroethyl;

and R_2 and R_3 when taken separately are independently C_1–C_4 alkyl, benzyl or phenethyl, and when taken together with the attached nitrogen are pyrrolidino, piperidino, morpholino, thiomorpholino or a 4-substituted piperazino group of the formula



wherein R_4 is C_1–C_4 lower alkyl.

4,065,619

7-(α-SULFOACYLAMIDO)CEPHALOSPORINS

Shiro Morimoto, Kobe; Hiroaki Nomura, Takatsuki; Takeshi Fugono, Kawanishi, and Isao Minami, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

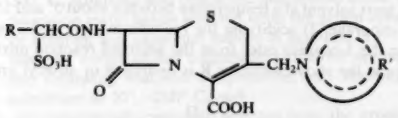
Continuation of Ser. No. 552,752, Feb. 25, 1975, abandoned, which is a continuation of Ser. No. 272,637, July 17, 1972, abandoned. This application Sept. 2, 1976, Ser. No. 719,704

Claims priority, application Japan, July 17, 1971, 46-53466; Oct. 22, 1971, 46-84130

Int. Cl.² C07D *501/44, 501/46;* A61K *31/545*

U.S. Cl. 544—25 **6 Claims**

1. A compound of the formula:



wherein R is phenyl or thienyl, and R' is a group which constitutes together with the adjacent nitrogen atom a pyridinium group, said pyridinium group being substituted by carbamoyl at the 4'-position, or a 4'-methyl-5'-(β-hydroxyethyl)-thiazolium or a pharmaceutically acceptable salt thereof.

4,065,620

3-(SUBSTITUTED) VINYL CEPHALOSPORINS

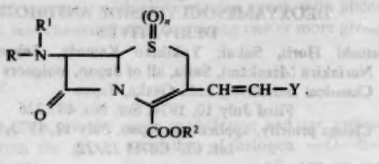
John Alan Webber, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 14, 1971, Ser. No. 153,065

Int. Cl.² C07D *501/18, 501/20*

U.S. Cl. 544—16 **18 Claims**

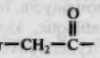
1. A compound of the formula



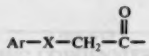
wherein

n is **0** or **1**;

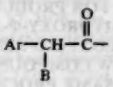
R is hydrogen, cyanoacetyl or a group of the formula



wherein Ar is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyrrolyl, 3-pyrrolyl, phenyl, or nitrophenyl;

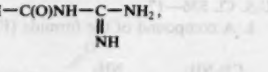


wherein X is oxygen or sulfur and Ar is as defined above;



wherein Ar is as defined above and B is —OH, or such —OH group protected by esterification with a C_1–C_6 alkanoic acid; or

B is —COOH, or such —COOH group protected by esterification with a C_1–C_6 alkanol; or B is



—NH-SO_3H, or —C(O)-NH_2;

R^1 is hydrogen, or

R and R^1 taken together with the nitrogen to which they are bonded denote —NH_3^+, a salt group with an acid having a pKa of less than 4, or a cyclic imide group from a C_3 to C_{12} hydrocarbon dicarboxylic acid;

R^2 is hydrogen,

C_4 to C_6-tert-alkyl,

C_5 to C_7-tert-alkenyl,

C_5 to C_7-tert-alkynyl, or

a pharmaceutically acceptable cation; and

Y is —C(O)$OR^3$where R^3 is C_1–C_4 alkyl, —CN, —COOH, —CHO, —X-C_1 to C_4 alkyl wherein X is oxygen or sulfur, —C(O)-NH_2, —NO_2, —S(O)-C_1C_4alkyl, —$S(O)_2C_1$-C_4 alkyl, or Cl, Br, or trifluoromethyl.

4,065,621

PROCESS FOR 3-ALKYL AND 3-PHENYL CEPHALOSPORINS

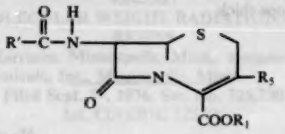
Wayne Alfred Spitzer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 576,818, May 12, 1975, Pat. No. 4,013,651. This application Sept. 3, 1976, Ser. No. 720,180

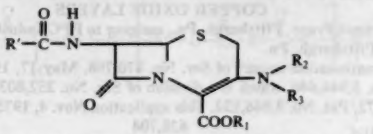
Int. Cl.² C07D *501/04*

U.S. Cl. 544—30 **5 Claims**

1. The process for preparing a 3-alkyl or 3-phenyl-3-cephem ester of the formula



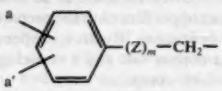
which comprises (1) reacting a compound of the formula



in an inert ether solvent at a temperature between about −80° and 5° C. with the Grignard reagent

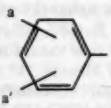
$BrMgR_5$

wherein R_5 is C_1-C_4 alkyl, or phenyl, (2) acidifying the reaction mixture and (3) separating the 3-alkyl- or 3-phenyl-3-cephem ester from the reaction mixture; where in the above formulas R′ is C_1-C_6 alkyl, C_1-C_3 cyanoalkyl, phenyl, halophenyl, methylphenyl, hydroxyphenyl, nitrophenyl, aminophenyl, or methoxyphenyl; or R′ is a group of the formula



wherein *a* and *a′* are independently hydrogen, C_1-C_4 alkyl, C_1-C_4 alkoxy, halogen, nitro, amino, or carboxy, Z is 0 or S, and *m* is 0 or 1; or R′ is a group of the formula

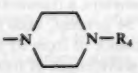
wherein P is thienyl, phenyl or



wherein *a* and *a′* are as defined above; Q is hydroxy, amino, carboxy or —SO_3H; or R′ is a group of the formula

$R''—CH_2—$

wherein R″ is thienyl, furyl, 2-oxazolyl, 2-thiazdyl, or 1-tetrazdyl; R_1 is benzyl, 4-nitrobenzyl, 4-methoxybenzyl, diphenylmethyl, t-butyl or 2,2,2-trichloroethyl; and $R_2$and R_3 when taken separately are independently C_1-C_4alkyl, benzyl or phenethyl, and when taken together with the attached nitrogen are pyrrolidino, piperidino, morpholino, thiomorpholino or a 4-substituted piperazino group of the formula



wherein R_4 is C_1C_4 lower alkyl.

4,065,622

O-2-ISOCEPHEM-4-CARBOXYLIC ACID DERIVATIVES AS ANTIBACTERIAL AGENTS

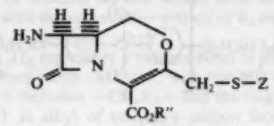
Donald E. Horning, Candiac; Leeson R. Morris, St. Lambert, and James L. Douglas, Montreal, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 598,461, July 23, 1975, Pat. No. 4,013,648. This application Sept. 23, 1976, Ser. No. 726,072

Int. Cl.[2] C07D *265/34*

U.S. Cl. 544—105 **3 Claims**

1. A compound having the formula



wherein R″ is hydrogen or an easily cleavable ester carboxyl-protecting group selected from the group consisting of benzhydryl, benzyl, p-nitrobenzyl, trichloroethyl, trimethylsilyl, phenacyl, acetonyl, (lower)alkyl, triphenylmethyl, methoxymethyl, indanyl, phthalidyl, pivaloyloxymethyl and acetoxymethyl and Z represents a radical of the formula

$aryl—(ALK)_m—$

in which aryl is phenyl or naphthyl, ALK represents a straight or branched chain alkylene radical and *m* is 0 or an integer of 1 to 4, said Z radical being optionally substituted by one or more substituents selected from halo, C_1-C_4 alkyl, C_1-C_4 alkoxy, cyano, carboxyl, amino, nitro, C_3-C_4 cycloalkyl, C_2-C_4 alkenyl, trifluoromethyl, hydroxy, hydroxymethyl, C_1-C_4 alkylthio, C_1-C_4 alkylamino, di(C_1-C_4 alkyl)amino, mercapto, phenyl, benzyl, alkoxyalkyl of up to 4 carbons or —$(CH_2)_n$-COOH in which *n* is an integer of 1 to 4, or a pharmaceutically acceptable salt thereof.

4,065,623

O-2-ISOCEPHEM-4-CARBOXYLIC ACID DERIVATIVES AS ANTIBACTERIAL AGENTS

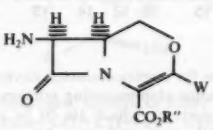
Bernard R. Belleau, Westmont, Canada; Terrence W. Doyle, Fayetteville, N.Y.; Bing Yu Luh, and Terry T. Conway, both of Brossard, Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 538,271, Jan. 2, 1975, Pat. No. 4,012,383. This application Aug. 19, 1976, Ser. No. 715,944

Int. Cl.[2] C07D *265/34*

U.S. Cl. 544—105 **12 Claims**

1. A compound of the formula



wherein W is benzyl or phenethyl and R″ is hydrogen or an easily cleavable ester carboxyl-protecting group selected from the group consisting of benzhydryl, benzyl, p-nitrobenzyl, p-methoxybenzyl, trichloroethyl, trimethylsilyl, phenacyl, acetonyl, (lower)alkyl, triphenylmethyl, methoxymethyl, indanyl, phthalidyl, pivaloyloxymethyl and acetoxymethyl, or a pharmaceutically acceptable salt thereof.

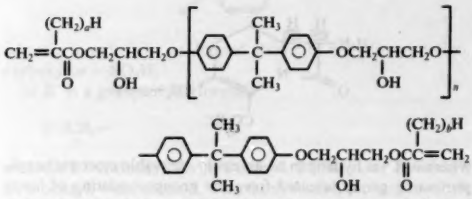
4,065,624

RADIATION CURABLE COATING COMPOSITION

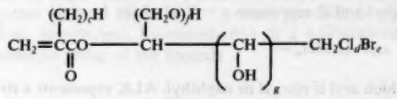
Paul J. Prucnal, Monroeville, and Robert DeMajistre, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 27, 1976, Ser. No. 652,687
Int. Cl.[2] C08F 2/50, 4/00, 20/22, 20/28
U.S. Cl. 428—522 16 Claims

1. A radiation curable coating composition having a binder comprising resin represented by the formula:



dissolved in a reactive solvent represented by the formula:



wherein

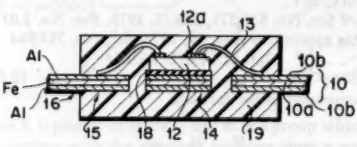
a. the average value of n is in the range of from 0 to 3;
b. the average values of a, b and c are each independently in the range of from 0 to 1;
c. the average value of d is in the range of from 0 to 1;
d. the average value of e is in the range of from 0 to 1;
e. $d + e = 1$;
f. the average value of f is in the range of from 0 to 1;
g. the average value of g is in the range of from 0 to 1; and
h. $f + g = 1$.

4,065,625

LEAD FRAME FOR A SEMICONDUCTOR DEVICE

Naoji Iwai, Tokyo; Takashi Uchida, Yokohama, and Takemi Abe, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 30, 1975, Ser. No. 627,258
Claims priority, application Japan, Oct. 31, 1974, 49-124932
Int. Cl.[2] B23P 3/20; H01L 23/48
U.S. Cl. 428—596 3 Claims



1. A lead frame for a semiconductor device comprising:

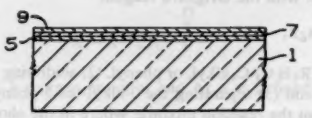
a. a semiconductor chip-mounting portion;
b. inner lead portions which are to be connected to the electrode of the semiconductor chip;
c. outer lead portions connected to the inner lead portions; and
d. connection portions which couple said chip mounting portion, outer and inner lead portions together; wherein said chip-mounting portion, inner lead portions and outer lead portions are each formed of an iron core sheet, both sides of which are clad with layers of an aluminum alloy containing 0.5% to 1.5% by weight of silicon and 0.3 to 0.6% by weight of iron, wherein said layers are from 2 - 20 microns thick.

4,065,626

GOLD-APPEARING FILMS OF COPPER, NICKEL AND COPPER OXIDE LAYERS

Helmut Franz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 470,768, May 17, 1974, Pat. No. 3,944,440, which is a division of Ser. No. 252,803, May 12, 1972, Pat. No. 3,846,152. This application Nov. 4, 1975, Ser. No. 628,704
Int. Cl.[2] B05D 3/02, 3/10, 5/06; G02B 27/10
U.S. Cl. 428—629 6 Claims



1. In a method of making a coated article comprising the steps of:

preparing a surface of a substrate to be coated
and depositing a copper film onto the prepared surface of the substrate by contacting it with a copper plating solution comprising a copper salt and a reducing agent, the improvement which comprises

a. adding to said copper plating solution an amount of a triazole sufficient to render the film brown in appearance;
b. depositing a nickel film onto the brown copper film by contacting it with a nickel plating solution comprising a nickel salt and a reducing agent;
c. depositing a copper film onto the nickel film by contacting it with a copper plating solution comprising a copper salt and a reducing agent;
d. contacting the copper film which has been deposited onto the nickel film with a surfactant which is capable of rendering the surface hydrophobic upon drying; and
e. heating the substrate and its three films to a temperature of at least about 300° F. (150° C.) in an oxidizing environment for a sufficient time to oxidize the copper film deposited onto the nickel film.

6. A transparent article of manufacture for the selective reflection of radiation over an extended spectral range comprising in combination:

a. a clear glass substrate
b. at least three coating layers affixed to a surface of said clear glass substrate:
1. a brown copper layer consisting essentially of copper deposited onto the glass in the presence of a triazole;
2. a copper oxide layer made by depositing copper and then oxidizing it; and
3. a nickel layer sandwiched between the brown copper layer and the copper oxide layer wherein the layers have respective thicknesses sufficient to provide the article with a luminous transmittance of from 12 to 22 percent a transmittance dominant wavelength of from 575 to 580 nanometers, a transmittance excitation purity of from 44 to 54 percent, and, from the glass side, a luminous reflectance of from 35 to 55 percent, a reflective dominant wavelength of from 570 to 585 nanometers and a reflective excitation purity of from 12 to 35 percent.

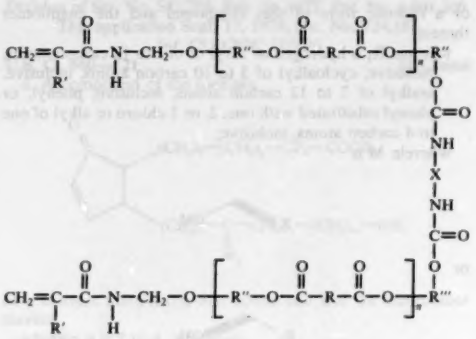
4,065,627

HIGH MOLECULAR WEIGHT RADIATION CURABLE RESINS

Stuart A. Harrison, Minneapolis, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Sept. 27, 1976, Ser. No. 726,730
Int. Cl.[2] C07C *125/06*
U.S. Cl. 560—26 **2 Claims**

1. The diisocyanate derivative of the formula:



wherein X is an aromatic hydrocarbon, cycloaliphatic hydrocarbon or aliphatic hydrocarbon group containing 4 to 38 carbon atoms, R is an aliphatic hydrocarbon or aromatic hydrocarbon group containing four to eight carbon atoms, R′ is hydrogen or a methyl group, R″ is an aliphatic hydrocarbon group containing two to eight carbon atoms with the proviso that the aliphatic hydrocarbon group can contain ether linkages, R‴ is an aliphatic hydrocarbon group containing two to eight carbon atoms with the priviso that the aliphatic hydrocarbon group can contain ether linkages, R″ and R‴ when containing ether linkages have the formulae $(-R_a-O-R_b)-$, $-(R_a-O-R_b-O-R_c)-$ or $-(R_a-O-R_b-O-R_c-O-R_d)-$ wherein R_a, R_b, R_c, and R_d are alkylene groups containing in total from four to eight carbon atoms, and n is an integer from two to five.

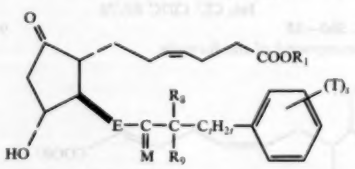
4,065,628

17-PHENYL-18,19,20-TRINOR-CIS-4,5-DIDEHYDRO-PGE, COMPOUNDS

Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 580,747, May 27, 1975, Pat. No. 4,032,561. This application Nov. 12, 1976, Ser. No. 741,245
Int. Cl.[2] C07C *69/76*
U.S. Cl. 560—53 **7 Claims**

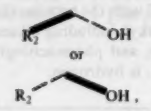
1. An optically active compound of the formula:



or a racemic form of that compound and the enantiomer thereof,

wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive;

wherein M is



wherein R_2 is hydrogen, methyl, or ethyl;

wherein E is trans—CH=CH— or $—CH_2CH_2—$;

wherein R_8 is hydrogen and R_9 is hydrogen, methyl, or fluoro, or wherein R_8 and R_9 are both methyl or both fluoro, with the proviso that neither of R_8 and R_9 is methyl when R_2 is methyl or ethyl;

wherein C_7H_{2l} represents a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive, between $—CR_8R_9—$ and the ring; and

wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_3$, wherein R_3 is alkyl of one to 4 carbon atoms, inclusive and wherein *s* is zero, one, 2, or 3 with the proviso that not more than 2 T's are other than alkyl; including alkanoates of 2 to 8 carbon atoms, inclusive, and pharmacologically acceptable salts thereof when R_1 is hydrogen.

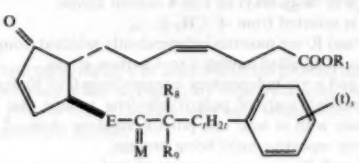
4,065,629

17-PHENYL-18,19,20-TRINOR-CIS-4,5-DIDEHYDRO-PGA$_1$ COMPOUNDS

Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 580,747, May 27, 1975, Pat. No. 4,032,561. This application Nov. 12, 1976, Ser. No. 741,244
Int. Cl.[2] C07C *69/76*
U.S. Cl. 560—5 B **7 Claims**

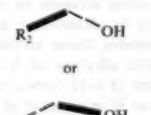
1. An optically active compound of the formula:



or a racemic form of that compound and the enantiomer thereof,

wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive;

wherein M is



wherein R_2 is hydrogen, methyl, or ethyl;

wherein E is trans—CH=CH— or $—CH_2CH_2—$;

wherein R_8 is hydrogen and R_9 is hydrogen, methyl, or fluoro, or wheren R_8 and R_9 are both methyl or both fluoro, with the proviso that neither of R_8 and R_9 is methyl when R_2 is methyl or ethyl;

wherein C_7H_{2l} represents a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive, between $—CR_8R_9—$ and the ring; and

wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_3$, wherein R_3 is

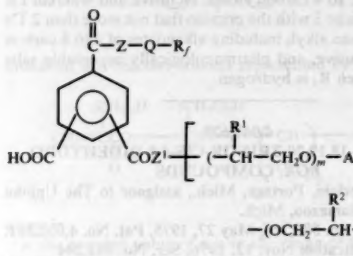
alkyl of one to 4 carbon atoms, inclusive and wherein s is zero, one, 2, or 3 with the proviso that not more than 2 T's are other than alkyl; including alkanoates of 2 to 8 carbon atoms, inclusive, and pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,065,630
POLYOXYALKYLENE FLUOROALKYLTRIMELLITATES

Stanley Robert Sandler, Springfield, Pa., assignor to Pennwalt Corporation

Division of Ser. No. 596,779, July 17, 1975, Pat. No. 3,994,951. This application Sept. 10, 1976, Ser. No. 722,179
Int. Cl.² C07C *69/76, 101/42, 125/06*
U.S. Cl. 560—26 **12 Claims**

1. A compound of the formula



wherein:

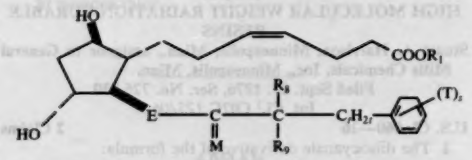
a. the ring is 1, 3, 4 tri-substituted
b. Z is NR, Z^1 is O and Z^2 is selected from O, S, or NR where R is H or an alkyl of 1 to 4 carbon atoms,
c. Q is selected from $+CH_2+_{1-10}$,
d. R^1 and R^2 are moieties independently selected from hydrogen or an alkyl having 1 to 4 carbon atoms,
e. m and p are independent integers from 0 to 30 describing repeating units of polyoxyalkylene groups that form a chain with at least one polyoxyalkylene chain of at least three repeating units being present,
f. R^1 and R^2 are one or more of said moieties within the repeating units m and p,
g. R_f is selected from the group consisting of a linear or branched perfluoroalkyl a linear or branched monochloroperfluoroalkyl, ora linear or branched perfluoroisoalkoxyalkyl wherein each member of the group has 3 to 20 carbon atoms,
h. *r* is an integer from 1 to 10,
i. A is a linking group selected from the group consisting of the acyl segment of alkanoic or mono or dicyclic aromatic polycarboxylic acids, alkanoic or mono or dicyclic aromatic anhydrides or alkanoic or mono or dicyclic aromatic polycarbamates, linear alkylene of 2 to 12 carbon atoms or a cyclic alkylene of 5–8 carbon atoms or a branched alkylene of 3–12 carbon atoms, and
j. R^3 is selected from H or an alkyl of 1 to 20 carbon atoms.

4,065,631
17-PHENYL-18,19,20-TRINOR-CIS-4,5-DIDEHYDRO-$PGF_{1\beta}$ COMPOUNDS

Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 580,747, May 27, 1975, Pat. No. 4,032,561. This application Nov. 12, 1976, Ser. No. 741,246
Int. Cl.² C07C *69/76*
U.S. Cl. 560—55 **7 Claims**

1. An optically active compound of the formula:



or a racemic form of that compound and the enantiomer thereof,

wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive;

wherein M is

or

wherein R_2 is hydrogen, methyl, or ethyl;

wherein E is trans—CH=CH— or $-CH_2CH_2-$;

wherein R_8 is hydrogen and R_9 is hydrogen, methyl, or fluoro, or wherein R_8 and R_9 are both methyl or both fluoro, with the proviso that neither of R_8 and R_9 is methyl when R_2 is methyl or ethyl;

wherein C_7H_{2r} represents a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive, between $-CR_8R_9-$ and the ring; and

wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_3$, wherein R_3 is alkyl of one to 4 carbon atoms, inclusive and wherein s is zero, one, 2, or 3 with the proviso that not more than 2 T's are other than alkyl; including alkanoates of 2 to 8 carbon atoms, inclusive, and pharmacologically acceptable salts thereof when R_1 is hydrogen.

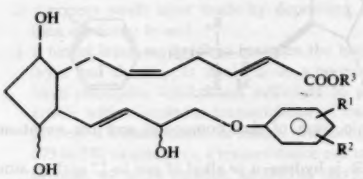
4,065,632
16-PHENOXY AND PHENYLTHIO PROSTAGLANDIN DERIVATIVES

Masaki Hayashi; Seiji Kori; Hajimu Miyake, and Takanori Okada, all of Osaka, Japan, assignors to Ono Pharmaceutical Company, Osaka, Japan

Filed Aug. 12, 1976, Ser. No. 713,941
Claims priority, application United Kingdom, Aug. 20, 1975, 34688/75; Oct. 22, 1975, 43464/75
Int. Cl.² C07C *69/76*
U.S. Cl. 560—55 **9 Claims**

1. A compound of the formula

VII



wherein R^1 and R^2, which may be the same or different, each represent a hydrogen or halogen atom, a trifluoromethyl group, or a straight- or branched-chain alkyl or alkoxy group containing from 1 to 4 carbon atoms, R^3 represents a hydrogen

atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms and the double bonds depicted in positions C_{2-3}, C_{5-6} and C_{13-14} are trans, cis and trans respectively, the cyclodextrin clathrates thereof and non-toxic salts thereof.

4,065,633

2,2-DIFLUORO-13,14-DIHYDRO-PGA$_1$ ANALOGS

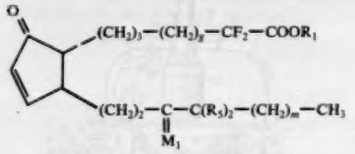
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 552,708, Feb. 24, 1975, Pat. No. 4,001,300. This application Sept. 17, 1976, Ser. No. 724,155

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 560—121 **18 Claims**

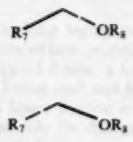
1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof,

wherein *g* is 2 to 4, inclusive;

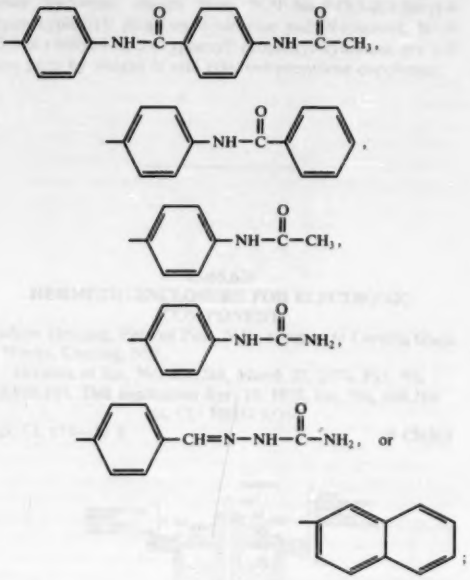
wherein M_1 is



wherein R_7 and R_8 are hydrogen or methyl, with the proviso that one of R_7 or R_8 is methyl only when the other is hydrogen;

wherein *m* is 2 to 4, inclusive;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation,



wherein

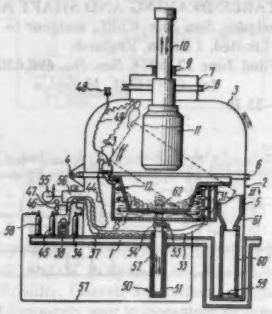
R_5 is hydrogen, methyl, or fluoro with the proviso that R_5 is fluoro only when R_7 and R_8 are both hydrogen, and with the proviso that R_5 is hydrogen only when either one of R_7 and R_8 is methyl.

4,065,634

SKULL FURNACE FOR MELTING HIGHLY REACTIVE METALS UNDER VACUUM OR NEUTRAL ATMOSPHERE

Semen Moiseevich Beizerov, ulitsa B. Akademicheskaya, 73, korpus 2, kv. 72; Felix Petrovich Vyboischikov, ulitsa Studencheskaya, 38, kv. 31, both of Moscow; Vladimir Viktorovich Bloshenko, ulitsa Severnaya, 36, kv. 6, Odintsovo Moskovskoi oblasti, and Jury Mikhailovich Syaskin, ulitsa Lobnenskaya, 9a, kv. 41, Moscow, all of U.S.S.R.

Filed Feb. 23, 1976, Ser. No. 660,461
Int. Cl.[2] F27D 7/06, 9/00
U.S. Cl. 13—10 6 Claims



1. A skull furnace for melting highly reactive metals under vacuum or in a neutral atmosphere provided by a neutral gas source, comprising: a support frame; a body of said furnace rigidly mounted on said frame, and said body being horizontally split so as to form a lower portion and an upwardly tiltable crown hinged at one side for opening and closing said furnace; a movable electrode holder secured to said crown in a substantially vertical position so as to be reciprocably movable back and forth from an upper idle position to a lower working position; a tiltable crucible having an inner body and an outer housing located below said electrode holder in the body of said furnace and having a cavity therebetween for a liquid metal cooling agent, said cavity being entirely confined between the body and housing of said crucible to provide, when the furnace is in the working position, for the free convective motion of said liquid metal cooling agent for cooling the body of said crucible; an expansion reservoir filled with a neutral gas and communicating with said cavity for receiving the excess of said cooling agent when it expands during the melting process; a safety device mounted outside said body of said furnace for relieving the excess pressure from said expansion reservoir; a tubular heat exchanger placed in said cavity for the liquid metal cooling agent, the ends of which are connected to cooling water collectors; pipes rigidly connected with said cooling water collectors, extending along the sides of said crucible, and hermetically passing through the walls of said body of the furnace generally below said crown, and being supported so as to allow the tilting of said crucible for pouring out the molten metal and said pipes are connected to respective flexible water inlet and outlet pipe lines.

4,065,635

ELECTRICAL CABLES INSULATED WITH EXTRACTION RESISTANT STABILIZED MATERIAL

Kornel D. Kiss, Yonkers, N.Y., assignor to Dart Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 390,834, Aug. 23, 1973, abandoned. This application Dec. 16, 1975, Ser. No. 641,313
Int. Cl.[2] H01B 7/28
U.S. Cl. 174—23 R 3 Claims

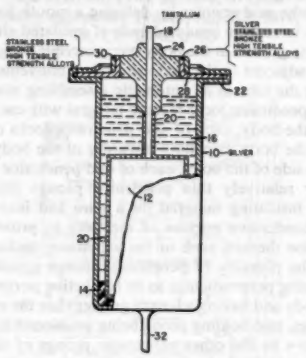
1. In an outer-jacketed electrical cable suitable for use in underground installations and comprising a plurality of metal wires individually encased in an insulating covering having an ethylene-propylene copolymer resin base containing a minor addition of protective stabilizer with said insulating covering being immersed in a high viscosity liquid filler compound based upon petroleum fractions or polyethylene wax, the improvement wherein said protective stabilizer consists essentially of between about 2500 and about 20,000 parts of disubstituted hydrazine chosen from N,N[1]-bis-β-(3,5-di-t-butyl-4-hydroxyphenyl) propionyl-hydrazine and N-stearoyl, N[1]-β-(3,5-di-t-butyl-4-hydroxyphenyl) propionyl-hydrazine per million parts by weight of said ethylene-propylene copolymer.

4,065,636

HERMETIC ENCLOSURE FOR ELECTRONIC COMPONENT

Andrew Herczog, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 454,289, March 25, 1974, Pat. No. 3,918,147. This application Apr. 18, 1975, Ser. No. 569,186
Int. Cl.[2] H01G 9/10
U.S. Cl. 174—52 S 6 Claims



1. An enclosure comprising

a silver container open at one end, said container having a tubular wall portion and a unitary outwardly protruding flange at said open end, said unitary outwardly protruding flange having a U-shaped cross-section and having two substantially parallel walls which are in a plane substantially perpendicular to said wall portion,

an electrical component having a metallic lead extending from one end thereof, said component being disposed within said container,

a glass bead sealed to said lead along its length intermediate the ends thereof, and

a metallic collar having a temperature coefficient of expansion greater than said glass bead fitted about said glass bead so as to place said glass bead in compression thereby effecting a compression seal between said collar and said glass bead, said metallic collar having a unitary outwardly protruding flange in a plane substantially perpendicular to said collar and disposed between and in contact with said two walls of said unitary outwardly protruding flange of said container, said unitary outwardly protruding flange of said collar being hermetically sealed to the unitary outwardly protruding flange of said container.

4,065,637

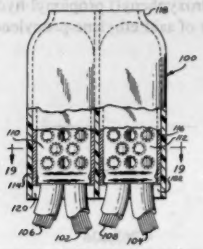
ELECTRICAL CONNECTOR

Kenneth C. Allison, 1546 S. Shore Drive, Crystal Lake, Ill. 60014

Continuation-in-part of Ser. No. 393,601, Aug. 31, 1973, abandoned. This application July 27, 1976, Ser. No. 709,171

Int. Cl.[2] H01R *11/08, 11/20*

U.S. Cl. 174—87 **3 Claims**



1. An electrical connector particularly adapted for mechanically holding and electrically connecting insulated ends of insulated wires and being particularly adapted for assembly in an automatic assembling machine, including: an elongated conductive resilient penetrator tube having a cylindrical body, having a pair of opposed sides, formed of a single thin sheet folded on itself, with opposed edges in abutting juxtaposition, an outwardly flared annular lip formed integral with one end of the body, said annular lip defining a mouth for said end of the body to receive insulated ends of insulated electrical wire, an annular groove in the body circumscribing said body at the one end adjacent to the lip to provide a convenient means for handling the tube in an automatic assembling machine, a plurality of penetrator locks formed integral with each of opposite sides of the body, each of said penetrator locks on one of the sides of the body extending inwardly of the body toward the opposite side of the body, each of said penetrator locks including four relatively thin penetrator prongs for penetration through insulating material on a wire and into engagement with a conductive portion of the wire to provide electrical connection thereto, each of the penetrator locks including as one of the plurality of penetrator prongs a resilient holding prong being perpendicular to its respective portion of the side of the body and having a length greater than the other penetrator prongs, said holding prong being positioned adjacent to the lip relative to the other penetrator prongs of the respective penetrator lock, each of the holding prongs is spaced from adjacent groups of the respective penetrator lock a greater angular distance than the angular distance between the other prongs of the respective penetrator lock, each of the holding prongs having a rounded side adjacent to the lip and being resiliently displaceable from the perpendicular to facilitate insertion of the insulated wires into the tube but holding the wire away from the other penetrator prongs during insertion while the wire rides into the tube of the respective rounded sides of the holding prongs whereby the holding prong holds the insulated wire away from the penetrator prongs while the wire is being inserted into the tube and crimping of the tube forces the holding prong to enter the insulating material of the wire substantially perpendicular to the wire and to force the penentrator prongs through the insulating material into contact with a conductive portion of the wire; a permanently deformable electrically-conductive tubular sheath mateably and slideably receiving said conductive penetrator tube, said sheath having one end open, said opening of the sheath being symmetrical with the outer periphery of the outwardly flared annular lip; and an insulator tube surrounding the deformable sheath, whereby application of sufficient force to opposite sides of the insulating tube deforms the deformable sheath and the penetrator tube to force penetrator prongs through the insulating material of a pair of insulated ends of insulated electrical wires positioned in the penetrator tube and into electrical contact with the electrical wires, the permanently deformable sheath holds the prongs of the penetrator tube in contact with the wires and the conductive penetrator tube and the conductive sheath provides electrically-conductive paths between the wires held in the penetrator tube while the insulated tube electrically inslates the exterior of the permanently deformable sheath.

4,065,638

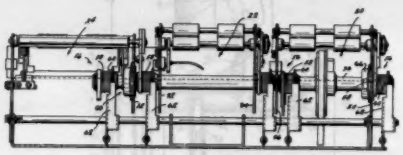
DEMOUNTABLE BEARING AND SHAFT ASSEMBLY

Ralph F. Manriquez, San Jose, Calif., assignor to International Computers Limited, London, England

Filed June 22, 1976, Ser. No. 698,630

Int. Cl.[2] H04L *13/04*

U.S. Cl. 178—23 R **6 Claims**



1. Demountable bearing and shaft assembly including a shaft of predetermined diameter; at least one bearing member for the shaft having a cylindrical body portion with a shaft-receiving aperture longitudinally therethrough, at least two ears forming an incomplete flange about the body portion at one end thereof and a circumferential groove in the body portion spaced away from the flange; a mounting plate having opposed surfaces forming a side wall perpendicular to the longitudinal axis of the shaft having a bearing locating aperture formed therein to receive and locate the body portion of the bearing member, the aperture having cutaway portions proportioned and positioned to correspond with the ears of the flange and a bowed spring retainer engageable in the groove of the body portion; the bearing member in use being engaged with the plate by the passage of the ears of the flange through the cutaway portions of the aperture, the bearing member thereafter being rotated in the aperture to bring the ears into abutting engagement with one surface of the plate of those positions between the cutaway portions, the spring retainer then contacting the opposite surface of the plate to maintain the member in the plate by spring tension.

4,065,639

SYNCHRONOUS TRANSMISSION CONTROL SYSTEM

Seigo Suzuki, Yokohama, and Seiji Eguchi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1976, Ser. No. 732,701

Claims priority, application Japan, Oct. 15, 1975, 50-124147

Int. Cl.[2] H04L *7/00*

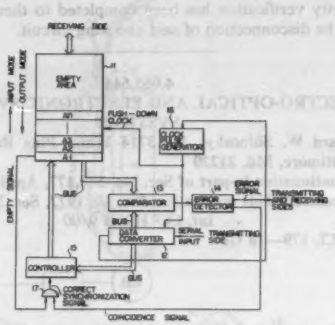
U.S. Cl. 178—69.1 **3 Claims**

1. a synchronous transmission system for synchronously transmitting data between transmitting and receiving sides, comprising:

a first-in/first-out stack for storing plural kinds of synchronous pattern signals;

means for successively comparing the synchronous pattern signals stored in said stack with the synchronous pattern signals transmitted from the transmitting side, respectively, in a predetermined timing;

means for detecting the result of the comparison of said comparison means; and



means for switching the direction of the data flow in said stack in response to the output of said detecting means.

4,065,640

APPARATUS FOR INTERCONNECTING A TELEPHONE LINE AND A PORTABLE CALCULATOR

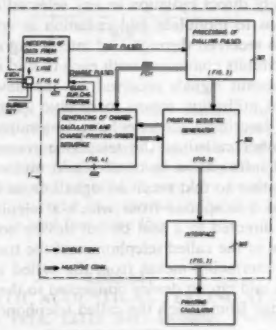
Jean Marie Rouiller, Couvet, Switzerland, assignor to Stoppani S.A., Etablissements pour la mecanique de precision et l'electro-mecanique, Bern and Oliver Technik AG, Zurich, both of, Switzerland

Filed July 19, 1976, Ser. No. 706,590

Claims priority, application Switzerland, July 31, 1975, 10012/75

Int. Cl.² H04M *15/00*

U.S. Cl. 179—7.1 TP **9 Claims**



1. An apparatus for interconnecting a telephone line and a calculator equipped with a printer, with display means, and with input members in the form of keys or the like for introducing numeric values and operating orders, said apparatus being of the type which controls said calculator as a function of dialling and charge data appearing on said telephone line and which causes said calculator to print a called telephone number, to display the charges successively incurred during the call, and to print the total charge for said call upon termination thereof, the improvement comprising:

first means connected to said telephone line for separately detecting dialling-type pulses and charge-type pulses,

second means for establishing connections to said calculator only at contacts corresponding to said input members,

processing means connected to said first means for recognizing and processing true dialling pulses,

order-transmitting means connected to said second means and to said processing means for controlling the printing by said printer of numeric values corresponding to pulse trains formed by said dialling pulses, and

calculation and charge-printing control means connected to said first means and to said order-transmitting means for recognizing true charge pulses and for emitting for each charge pulse a control sequence for adding a charge unit, said sequence comprising elementary orders which are transmitted by said order-transmitting means to said calculator via said second means, thereby causing sold calculator to display the total of said charge units,

said processing means being responsive to the end of said call for generating an end-of-call signal, and said control means being connected to said processing means for receiving an end-of-call signal said for thereupon emitting a charge-printing order which is transmitted by said order-transmitting means to said calculator, thereby causing said calculator to print said displayed total.

4,065,641

HIGH CAPACITY TIME CONNECTION NETWORKS

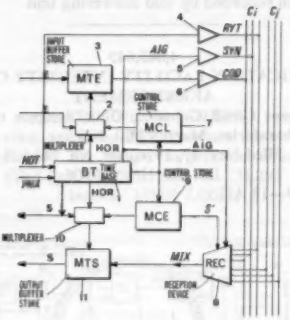
Jacques Henri Provendier, Lannion, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Mar. 30, 1976, Ser. No. 671,826

Claims priority, application France, Apr. 18, 1975, 75.12180

Int. Cl.² H04J *3/00*

U.S. Cl. 179—15 AT **1 Claim**

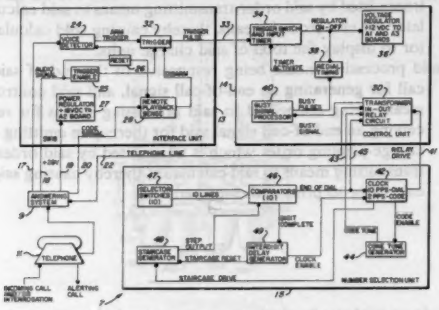


1. A time connection network of the kind comprising *p* switching units having each an input buffer store and an output buffer store, and a space stage to transmit digital information in form of words or groups of *n* binary digits from one input buffer store toward one output buffer store at a rate of one word per digit time slot, comprising means for serially transmitting the information signals read in an input buffer store, means for transmitting clock signals at the rate of said series transmission, means for generating a rectangular signal having a period of *m* words, preferably of two words, means for distributing information signals and clock signals in two paths A and B, one path being gated by the leading edges of said rectangular signal and the other path by the trailing edges of the same signal, means for serial-to-parallel converting the information signals controlled by said clock signals, means for re-phasing the transmitted signals, controlled by said rectangular signal, serial-to-parallel conversion and re-phasing being carried out in each path, and means for multiplexing signals from paths A and B and transmitting them to an output buffer store.

4,065,642
MESSAGE SIGNALING AND ALERTING SYSTEM AND METHOD THEREOF

William C. McClure, 1906 S. Nome St., Denver, Colo. 80232

Filed Apr. 24, 1975, Ser. No. 571,435
Int. Cl.[2] H04M 3/42
U.S. Cl. 179—18 B 62 Claims



1. A telephone signaling system for use with an electronic answering unit that is connectable with a telephone so that when connected a caller can record a message for later playback by an intended recipient, said system comprising:

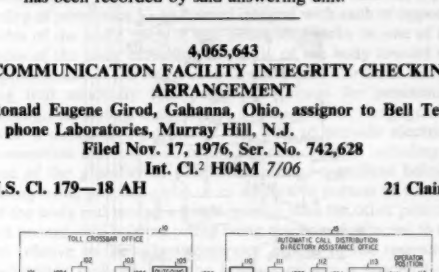
sensing means connected with said electronic answering unit for sensing recording of a message by said unit and providing an output indicative thereof; and

alerting means connected with said sensing means and upon receipt of said output therefrom providing a predetermined signal to be sent to a preselected device whereby an intended recipient can be quickly alerted that a message has been recorded by said answering unit.

4,065,643
COMMUNICATION FACILITY INTEGRITY CHECKING ARRANGEMENT

Ronald Eugene Girod, Gahanna, Ohio, assignor to Bell Telephone Laboratories, Murray Hill, N.J.

Filed Nov. 17, 1976, Ser. No. 742,628
Int. Cl.[2] H04M 7/06
U.S. Cl. 179—18 AH 21 Claims



1. An arrangement for verifying the integrity of an interoffice communication channel connecting a first terminal to a second terminal comprising:

means in said first terminal actuated by a receipt of a first check signal from a checking circuit selectively connected thereto for sending a first integrity verification signal over said interoffice channel to said second terminal,

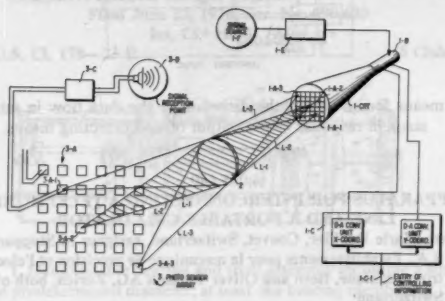
means in said second terminal actuated in response to a receipt of said first verification signal from said first terminal for transmitting thereto a second verification signal of predetermined duration to complete said interoffice integrity verification, and

means actuated by a receipt of said second verification signal and deactuated upon the expiration of said predetermined duration for delaying the transmission of a second check signal to said checking circuit until said interoffice integrity verification has been completed to thereafter effect the disconnection of said checking circuit.

4,065,644
ELECTRO-OPTICAL AND ELECTRONIC SWITCHING SYSTEMS

Leonard W. Shinosky, Jr., 3714 White Pine Road, Apt. C, Baltimore, Md. 21220

Continuation-in-part of Ser. No. 573,177, April 30, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,607
Int. Cl.[2] H04B 9/00
U.S. Cl. 179—18 GF 42 Claims



22. A telephone switching system comprising interfacing means to convert signals from telephones on single lines into two separate signals, one for receiving from the telephone and one for transmitting to the telephone, an array of substantially contiguous radiation sensitive electrical circuit devices, means to selectively direct radiation to any selected one of said devices, means to modulate said radiation in accordance with information received through said interfacing means, separate electrical circuits connected with each of said devices to electrically transmit signals received by the devices, and data storage and utilization means to receive information from a telephone describing the telephone transmitting and a telephone number called at the telephone transmitting and to utilize said information to control said means to selectively direct radiation so that received signals from said interfacing means from a telephone from which a telephone number is called are directed to a said circuit device connected to the receive line of the called telephone and the transmitted signal from said interfacing means from the called telephone is directed to a said circuit device connected to the receive line of the telephone from which the called telephone was called.

4,065,645
HEADSET

Donald E. Warner, North Hollywood, and George C. Oyama, Northridge, both of Calif., assignors to Audiotronics Corporation, North Hollywood, Calif.

Filed Oct. 26, 1976, Ser. No. 735,896
Int. Cl.[2] H04M 1/05
U.S. Cl. 179—156 R 7 Claims

1. A headset including a pair of earpieces and a continuous head strap extending from one earpiece to the other earpiece, the continuous head strap including end portions and the earpieces each including a cavity and with each end portion extending into the cavity in the earpiece and with the ends of the end portions enclosed within the earpieces and with the continuous head strap forming a flexible member for supporting the earpieces at the end portions,

the end portions of the head strap slideable within the cavities in the earpieces for providing adjustment of the head-

set and including stop members to limit the travel of the end portions, and

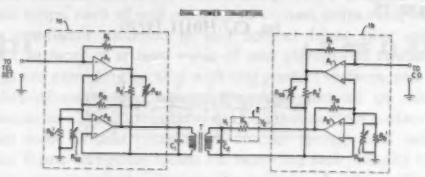
wires extending through the head strap from one end portion to the other end portion and into the earpieces and with the wires fuly contained within the continuous head strap and the earpieces.

4,065,646

POWER CONVERTER

Peter Otto Schuh, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 28, 1976, Ser. No. 700,325
Int. Cl.[2] H04B *3/36*
U.S. Cl. 179—170 R **8 Claims**



1. A bilateral AC-signal controller suitable for use in the two-wire portion of a telephone transmission line comprising:
a. a power converter disposed in said two-wire line, and
b. a directional threshold detector serially disposed in said two-wire line and adapted to supply a control signal to said power converter in response to the direction of AC-signal flow in said two-wire line.

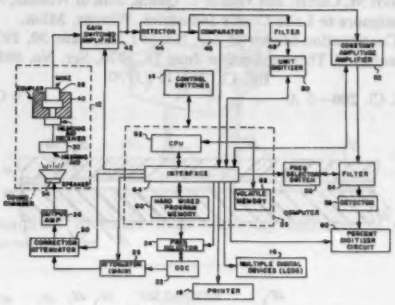
4,065,647

AUTOMATIC ACOUSTICAL TESTING SYSTEM

George Joseph Frye, 12175 SW. Douglas, Portland, Oreg. 97225, and Leonardus Johannes Geerling, Rte. 2, Box 124D, Hillsboro, Oreg. 97123

Continuation-in-part of Ser. No. 608,871, Aug. 29, 1975. This application July 19, 1976, Ser. No. 706,640
Int. Cl.[2] H04R *29/00*
U.S. Cl. 179—175.1 A **8 Claims**

1. An automatic acoustical testing system, comprising in combination:
oscillator means for generating a selected signal frequency;
amplifier means for receiving said selected signal frequency and amplifying same to provide an amplified driving signal;
means coupling said driving signal to an acoustical device to be tested;
means receiving an output from the device to be tested and digitially processing said output;
distortion analyzer circuit means receiving an output signal from said receiving and digitally processing means and further processing said output signal;
digital computer processor means interfacially connected to said oscillator means, amplifier means, receiving and digitally processing means and distortion analyzer circuit means for controlling and processing analog and digital signals provided to and derived from said oscillator means, amplifier means, receiving and digitally processing means and distortion analyzer circuit means; and
readout means interfacially connected to said digital computer processor means for providing readout of said analog and digital signals.

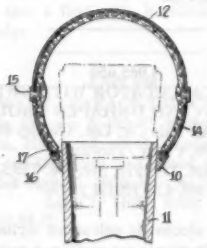


4,065,648

MICROPHONE SCREEN

Henry J. Cvetko, and Donald W. Peterson, both of Conneaut, Ohio, assignors to The Astatic Corporation, Conneaut, Ohio

Filed Oct. 12, 1976, Ser. No. 731,293
Int. Cl.[2] H04R *1/00*
U.S. Cl. 179—178 **10 Claims**



1. A microphone assembly, comprising:
a microphone body, having an externally threaded projection at an end thereof, said projection being of a smaller peripheral size than an adjoining portion of said body to provide a shoulder thereat,
a screen having a portion surrounding said projection,
a base ring having internal screw threads engaging the threads on said projection, and adapted to be threaded to functional position adjacent to said shoulder,
said screen having an opening, the defining peripheral portion of which is secured to said base ring.

4,065,649

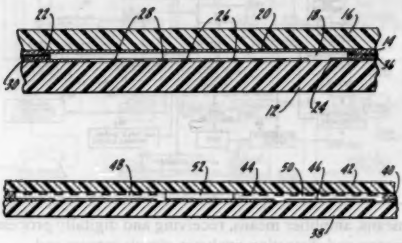
PRESSURE SENSITIVE MATRIX SWITCH HAVING APERTURED SPACER WITH FLEXIBLE DOUBLE SIDED ADHESIVE INTERMEDIATE AND CHANNELS OPTIONALLY INTERPOSED BETWEEN APERTURES

Everett M. Carter, and Wilbur C. Quain, both of Winona, Minn., assignors to Lake Center Industries, Winona, Minn.

Continuation-in-part of Ser. No. 591,772, June 30, 1975, abandoned. This application June 14, 1976, Ser. No. 695,968

Int. Cl.[2] H01H *13/70*

U.S. Cl. 200—5 A 9 Claims



1. In a switch control device, a backing layer with a printed circuit having switch conductors on the upper surface thereof defining at least one switch contact area, a flexible adhesive insulating layer adhering to the upper surface of the backing layer with at least one opening around the switch contact area, and a flexible contact layer adhering to the upper surface of the adhesive insulating layer and overlying the opening with a conductive shorting bar on the lower surface thereof aligned with the opening over the contact area, the flexibility and thickness of the adhesive insulating layer causing it to participate in the deformation of the contact layer to allow for contact of the shorting bar with the switch contact area without elongation of the contact layer when the contact layer is pressed toward the backing layer in the area aligned with the opening in the flexible adhesive insulating layer and causing spring return of the contact layer when such pressure is released, the adhesive insulating layer adhering to the upper surface of the backing layer and the lower surface of the contact layer to structurally retain the dimensional stability of the switch control device.

4,065,650

ELECTRONIC CALCULATOR WITH SWITCHES IN SOLID V- AND U-SHAPED GROUPS

Kwong-Li Lou, c/o Air Asia Co., Ltd., Quality Control Divison, Tainan, Taiwan 700, China /Taiwan

Filed Sept. 21, 1976, Ser. No. 725,233

Int. Cl.[2] H01H *13/70*

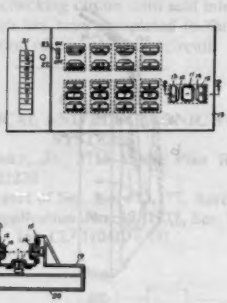
U.S. Cl. 200—5 R 8 Claims

1. In a hand-held electronic calculator including a housing having a substantially planar top surface, a switchboard comprising:

at least one solid group of push-button switches projecting above the top surface of said calculator housing for receiving a user's fingertip, said group including at least one upright push-button.

6. In a hand-held electronic calculator including a housing having a substantially planar top surface, a switchboard comprising:

a plurality of groups of push-button switches projecting above the top surface of said calculator housing for receiving the user's fingertips, at least one of said groups including an upright push-button, said groups of push-button switches being distributed in a one-to-one correspondence with each finger location,



whereby each finger can cover a corresponding group of push-buttons, active fingers can cover at least two groups, and inactive fingers can cover less used groups.

4,065,651

KEYBOARD SWITCH ASSEMBLY HAVING FLEXIBLE RUNG LADDER CONTACTS

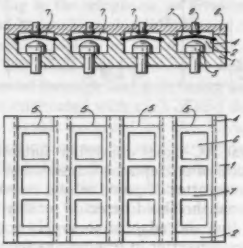
Bruno Erni, Bienne, and Pierre-Andre Meister, Ipsach, both of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed May 18, 1976, Ser. No. 687,472

Claims priority, application Switzerland, May 23, 1975, 6639/75

Int. Cl.[2] H01H *13/70*

U.S. Cl. 200—5 A 5 Claims



1. A keyboard comprising:

a support means;

a cover means;

a plurality of pushbuttons arranged in a matrix of rows and columns and having stem portions extending through said cover means;

a plurality of fixed contact means mounted on said support means in rows and columns whereby a fixed contact means is disposed opposite a corresponding one of said pushbuttons;

a plurality of flexible conductive contact members, one for each row of said matrix, each flexible conductive contact member being in the shape of a flat ladder having rungs, there being a rung for each column of said matrix;

said support means comprising a body having a plurality of partition walls separating a plurality of slots, said slots extending parallel to said rows;

said partition walls having longitudinal grooves therein on each side of each slot to provide a guideway for longitudinally inserting the flexible conductive contact members therein;

each said flexible conductive contact member being planar when unstressed and slightly wider than its guideway so

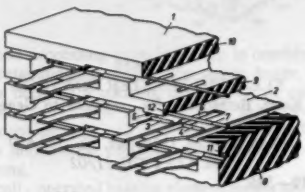
as to require flexing of the rungs to an arched form transverse to the length of the flexible conductive contact member when positioned in said guideway.

4,065,652

CONTACT ASSEMBLY AND MOUNTING STRUCTURE FOR CROSS BAR SELECTOR SWITCH

Bror Ludvig Lundkvist, Skarholmen; Sven-Erik Lindeberg, Huddinge, and Karl Sievert Forsberg, Lyckeby, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sept. 9, 1975, Ser. No. 611,680
Claims priority, application Sweden, Sept. 27, 1974, 7412184
Int. Cl.[2] H01H *1/24, 63/06*
U.S. Cl. 200—175 **4 Claims**



1. In a selector switch comprising a plurality of contact springs having transverse contact surfaces thereon, and a contact frame mounting said plurality of contact springs therein, wherein the improvement comprises: a plurality of contact strips, each of said plurality of contact strips comprising a conductor mounted in said contact frame near said contact surfaces of at least some of said plurality of contact springs and extending parallel with said contact surfaces, and a plurality of rod-shaped contact elements mounted on said conductor in a direction transversely of said contact surfaces of said some of said plurality of contact springs; and said contact frame comprises means for mounting said plurality of contact strips therein, said means comprising a plurality of first notched sections, each of said plurality of first notched sections having a groove which is open in a direction towards said contact surfaces mounted directly therebelow, and a plurality of second notched sections, each of said plurality of second notched sections having a groove which is open transversely to the direction of the grooves of said first notch sections, whereby said conductors of said contact strips are contained in said grooves of said first and second notched sections which accommodates said conductors after said conductors have been directed thereto.

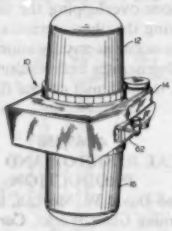
4,065,653

CIRCUIT BREAKER MOUNTED WITHIN AN EXPLOSION-PROOF ENCLOSURE

William B. Jones, Bloomington, Ill., assignor to General Electric Company, New York, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,775
Int. Cl.[2] H01H *9/04*
U.S. Cl. 200—302 **10 Claims**

1. In combination,
   a. an explosion-proof enclosure;
   b. a circuit breaker mounted within said enclosure, said circuit breaker comprising an insulating case, and a manually operable handle member extending from one surface of said case and movable between an on and an off position for opening and closing said circuit breaker;
   c. means operable externally of said enclosure for moving said handle of said circuit breaker between said on and off positions; and
   d. means provided by said case of said circuit breaker located on opposite sides of said handle of the circuit breaker for preventing exploding gases within said explo-



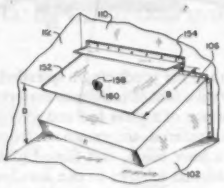
sion-proof enclosure from shattering said case of said circuit breaker.

4,065,654

MICROWAVE OVEN ADJUSTING (ENERGY DISTRIBUTION) AND TUNING ARRANGEMENT

Donald G. Moore, Glencoe, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Filed Dec. 1, 1975, Ser. No. 636,850
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 F **14 Claims**



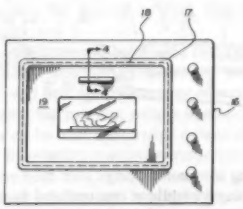
1. In a system for heating articles by supplying electromagnetic energy to the articles to be heated which are carried by a tray placed within a cavity defined in a heating structure of the system,
   means for adjusting the distribution of energy supplied to particular areas of the cavity comprising a first generally planar electrically conductive member positioned in the cavity and near a boundary of the cavity and being movable such that a first edge is rotatable about a second opposite edge.

4,065,655

MICROWAVE LEAKAGE INDICATOR STRIP

James Y. Wong, Ottawa; Satish C. Kashyap, Hazeldean, and John G. Dunn, Hammond, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 17, 1976, Ser. No. 687,237
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 D **3 Claims**



1. A microwave leakage indicator comprising in combination with a microwave oven having a door defining a slot

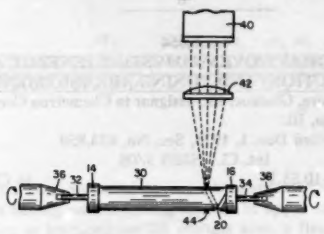
between the door and the oven where microwave leakage might occur, a strip of encapsulated liquid crystal film backed by a layer of microwave absorbing material mounted around the edge of the door overlapping the slot between door and oven, the film having the characteristics that if leakage above a preset level does occur at any location around the door the absorbing material generates heat resulting in a quickly noticeable color change in the liquid crystal film.

4,065,656

ELECTRICAL RESISTOR AND METHOD OF PRODUCTION

John T. Brown, and David W. Morgan, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed June 30, 1975, Ser. No. 591,309
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 LM **4 Claims**



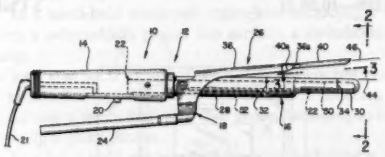
1. In a method for producing a spiralled, film type electrical resistor wherein a film of resistance material is deposited on the elongated surface of a glass rod and selected areas of said film of resistance material are removed from said glass rod by exposure to a laser beam, said filmed glass rod and said laser beam being moved relative to one another such that said film of resistance material is removed along a helical path about the periphery of said rod, the improvement which comprises incorporating FeO and/or CuO into the composition of said glass rod in an amount effective to absorb a sufficient amount of said laser beam to prevent damage to said film on the surface of said rod opposite to the surface exposed to said laser beam, said glass rod consisting essentially, in weight percent on the oxide basis, of 10–40% RO, wherein RO consists of at least two of the following oxides in the indicated proportions of 0–11% MgO, 0–12% CaO, 0–10% SrO, and 0–9%, BaO, 10–20% Al_2O_3, 0.1–5% FeO and/or CuO, 50–65% SiO_2, 0–10% B_2O_3, 0–3% SnO_2, and 0–2% As_2O_5 and/or Sb_2O_3.

4,065,657

CURLING IRON WITH STEPPED BARREL

Louis H. Zusser, Los Angeles, Calif., assignor to Northridge Trading Company, Northridge, Calif.

Filed Nov. 4, 1976, Ser. No. 738,641
Int. Cl.[2] H05B *3/00*; A45D *1/04*
U.S. Cl. 219—225 **7 Claims**



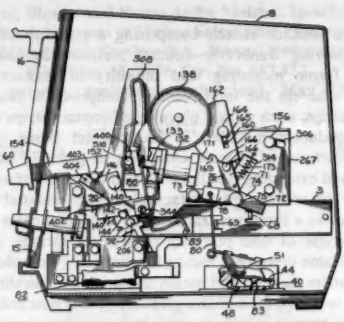
1. A curling iron comprising:
a body having a handle at one end and an elongated stepped barrel apparatus at the other end;
a heating element in said stepped barrel apparatus; and
a clamp device pivotally mounted on said body, said device having a handle at one end near said body handle and a clamping apparatus near said stepped barrel apparatus;
said stepped barrel apparatus having a small plurality of discrete barrel sections each of substantially different diameter spaced along its length, the barrel section closest said handle having the largest diameter and each successive barrel section having a successively smaller diameter, and said clamping apparatus extending along the length of said stepped barrel apparatus to overlay at least a portion of each barrel section.

4,065,658

ELECTRIC TOASTER CONTROL

Robert E. Keim, Bethlehem, Pa., assignor to General Electric Company, Bridgeport, Conn.

Filed Dec. 20, 1976, Ser. No. 752,629
Int. Cl.[2] F27D *11/02*
U.S. Cl. 219—386 **8 Claims**

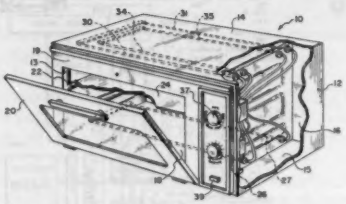


1. In an electric oven toaster wherein electric heating means supplies heat to a toasting chamber, a door is mounted on the oven toaster, a switch is provided for energizing and de-energizing the electric heating means, a toast timer is provided for opening the switch to de-energize the heating means at the end of a toasting cycle, a latch lever is positioned for operation by the toast timer and the door for opening the switch to de-energize the heating elements, and a manually operable lever is provided for closing the switch and starting the operation of said toast timer the improvement comprising:
a. a catch lever positioned between the manually operable lever and the latch lever for holding the latch lever in latched engagement therewith when the switch has been moved to its closed position for energizing the heating means;
b. means provided on said manually operable lever for moving the catch lever in one direction when the manually operable lever is moved in one direction for closing the switch for moving the catch lever into locking engagement with the latch lever to hold the latch lever and the catch lever in a toast timer operating position and the switch in a closed position; and
c. means on said manually operable lever for moving the latch lever to release the catch lever from the latch lever to stop the operation of said toast timer and open the switch upon manual movement of said manually operable lever.

4,065,659
FOOD PROCESSING OVEN

Ronald E. Yount, Boonville, and Robert A. Bell, Columbia, both of Mo., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Jan. 9, 1976, Ser. No. 647,875
Int. Cl.[2] F27D *11/02*
U.S. Cl. 219—398 12 Claims



1. A food processing oven including in combination:

a heat retaining enclosure having upper, lower, side and end walls defining a cooking cavity, one of said end walls defining an access opening into said cavity, a door mounted on said one end wall for movement between open and closed positions with respect to said access opening,

electrically operated heating element means mounted within said cavity for heating the interior thereof,

means provided in said cavity in spaced relation with said heating element means for supporting food to be cooked in said cavity,

circuit means coupled to a source of power and to said heating element means for energization of the latter to heat said cooking cavity,

thermostat means coupled to said circuit means and disposed for monitoring the temperature within said cavity thereby to maintain said cavity temperature below a preselected temperature level, and

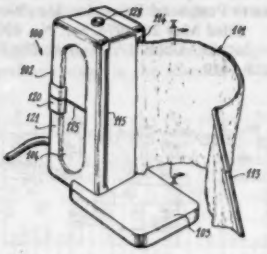
control means coupled to said circuit means and operable to a first mode for energizing said heating element means at full rated power output, said thermostat means being operable in said first mode for energizing and deenergizing said heating element means thereby to maintain said cavity temperature below said preselected temperature level, and to a second mode for energizing said heating element means at a reduced power output within the range of 10–30 percent of the full rated power output, said thermostat means being inactive in said second mode so that heating element means is energized continuously thereby to gradually increase the temperature in said cavity at a generally steady rate to within a predetermined temperature range of 220°–300° F.

4,065,660
ELECTRICAL APPLIANCE FOR HEATING FEEDING-BOTTLES AND LIKE CONTAINERS

Jean Claude Berard, Saint-Etienne, France, assignor to Seb S.A., Selongey, France

Filed Mar. 10, 1976, Ser. No. 665,569
Claims priority, application France, Apr. 4, 1975, 75.10612; Dec. 12, 1975, 75.38107
Int. Cl.[2] H05B *3/58*
U.S. Cl. 219—535 3 Claims

1. An electrical appliance for heating food containers, comprising a support having a base intended to receive the bottom of a container, said support having a handle, a relatively flexible heating quilt comprising an electric resistance wire and being secured to the handle, said resistance wire having two terminals intended to be connected with an electric supply, said heating quilt having two edge members and being foldable around the container placed on the base of said support and said heating quilt being secured to the handle by its two edge members, one of said edge members carrying means for fastening removably the heating quilt to the handle, wherein the two edge members are engaged in two parallel slots in spaced relation which extend vertically in the handle, said one edge member being removably engaged and fastened within the

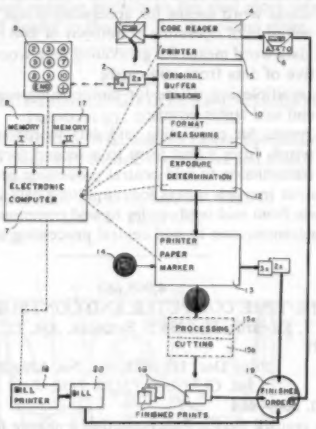


corresponding slot by means which comprise means for adjusting the engagement of the said one edge member within said corresponding slot.

4,065,661
PHOTOFINISHING APPARATUS

Jorg Jaskowsky, Stuttgart-Wangen, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 18, 1976, Ser. No. 659,181
Int. Cl.[2] G06K *15/00*; G03G *15/00*
U.S. Cl. 364—464 5 Claims



1. Photofinishing apparatus, comprising:

a. photographic printing means for producing photographic prints from originals;

b. data entry means for producing signals representative of the requirements for producing the prints;

c. bill printing means for printing a customer bill;

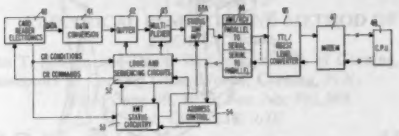
d. storage means for storing pricing data for the photographic prints; and

e. electronic computer control means electrically connected to said photographic printing means, said bill printing means, and said pricing data storage means for controlling said photographic printing means in response to said signals produced by said data entry means and for controlling said bill printing means in response to said signals produced by said data entry means and said pricing data stored in said pricing data storage means, whereby said data entered into said data entry means is entered only once thereby reducing the possibility of error in the printing of the bill.

4,065,662
CARD READER SYSTEM WITH IMPROVED INTERFACE

John S. Garczynski, Norristown; Charles C. Jablanofsky, Feasterville, and Joseph P. Murray, Schwenksville, all of Pa., assignors to Peripheral Dynamics, Inc., Norristown, Pa.

Filed May 26, 1976, Ser. No. 690,261
Int. Cl.[2] G06K *17/00, 7/00;* G06F *3/04*
U.S. Cl. 235—419 25 Claims



1. A card reader system providing for the interfacing of a plurality of card reader units with a central processing unit, comprising:

a. a central processing unit;

b. a plurality of card readers for reading cards, adapted to communicate with said central processing unit;

c. communication means for providing communication of information between said card readers and said central processing unit;

d. each of said plurality of card readers having

i. address means for receiving address signals from said central processing unit and for selectively enabling and disenabling card reader operation depending upon whether such card reader has been addressed;

ii. status word means for generating status words representative of operating conditions of said card reader;

iii. data word means for generating data words representative of data from said cards;

iv. multiplexing means for multiplexing said data words and said status words;

v. means for converting said data words and said status words from a first form to a second form suitable for transmission to said central processing unit; and

e. output transmit means for outputting data in said second form from said card reader to said communication means for transmission to said central processing unit.

4,065,663
RATE/TIME COMPUTER AND CONTROL DEVICE

James T. Edwards, II, 3236 S. Semoran, Apt. 12, Orlando, Fla. 32807

Filed Dec. 11, 1975, Ser. No. 639,650
Int. Cl.[2] G06F *15/20, 7/50, 7/52*
U.S. Cl. 364—464 31 Claims

1. A control device for computing a charge for an activity period, said control device comprising:

clock means for generating a representation of present time;

clock memory means having a plurality of clock memory addresses therein, each of said clock memory addresses for storing a start time therein;

rate memory means having a plurality of rate memory addresses therein, each of said rate memory addresses for storing a rate representation therein;

first selecting means for selecting one of said clock memory addresses, and for selecting one of said rate memory addresses;

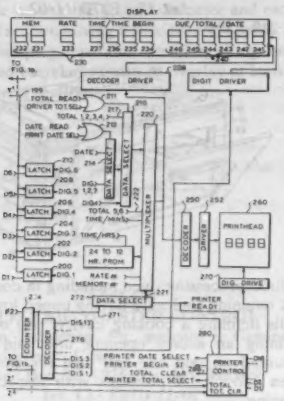
first input means for providing an input from said clock means to said selected clock memory address, said input representative of said start time;

second selecting means for selecting said rate representation;

second input means for providing an input from said second selecting means to said selected rate memory address;

first output means for providing an output signal representative of said start time from said selected clock memory address, and for providing an output signal representative of said rate representation from said selected rate memory address; and

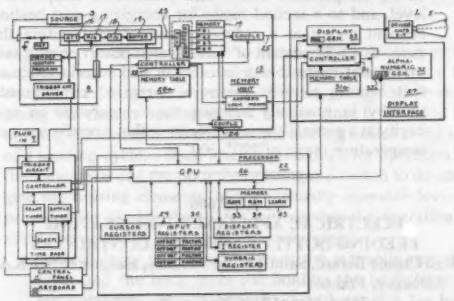
digital computation means for receiving input signals from said clock means and said first output means, for computing said activity period by subtracting said start time from said present time, and for computing said charge for said activity period by multiplying said rate representation by said activity period.



4,065,664
FLOATING POINT REGISTERS FOR PROGRAMMED DIGITAL INSTRUMENTS

Paul J. Kristof, and Frederick A. Rose, both of Fort Atkinson, Wis., assignors to Norland Corporation, Fort Atkinson, Wis.

Filed Mar. 26, 1976, Ser. No. 670,722
Int. Cl.[2] H01J *29/70;* G01R *23/16*
U.S. Cl. 364—487 11 Claims



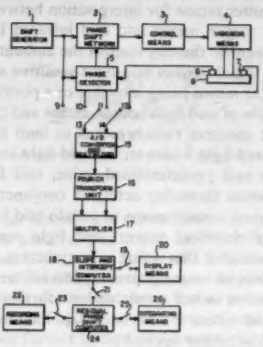
1. A waveform measuring and analyzing instrument comprising digital memory means for storage of the coordinates of the waveform in digitized form, a data acquisition means connected to said memory means for establishing digitized waveform signals of a waveform, a programmed processor having a program memory, an interactive user operated control means having a plurality of keystroke means for calculating with data in said memory means, said processor means including a plurality of data modifying registers for each block of said memory means, means for placing modifying values in said registers, said values being common to each location in each block of said memory means, said processor modifying the data in each of said locations in said block by said plurality of registers to create actual values of data.

4,065,665

METHOD AND APPARATUS FOR THE DETERMINATION OF START TIME DIFFERENCE AND OVERALL PHASE SHIFT BETWEEN TWO SIGNALS

Eike Rietsch, Celle, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Mar. 8, 1976, Ser. No. 664,441
Int. Cl.[2] G01R 25/00
U.S. Cl. 364—487 15 Claims



12. Apparatus for determining the time shift and total phase difference between two signals comprising phase difference means adapted to receive the two signals for determining a value $\psi(f)$, representative of the phase relationship between the two signals, for each frequency f contained in the two signals, and providing corresponding g signals, and their associated f signals, slope and intercept means connected to the phase difference means for determining a slope A and an ordinate intercept B of a best fitting straight line $g(f) = Af + B$ through the totality of the values ψ in accordance with the f and g signals and providing signals A and B corresponding to the slope A and the ordinate intercept B; time shift signal means connected to the slope and intercept means for providing an output corresponding to the time shift τ in accordance with signal A and the following equation:

$$\tau = A/2\pi;$$

and total phase shift signal means connected to the slope and intercept means for providing an output ψ_0 corresponding to the total phase shift in accordance with signal B and the following equation:

$$\psi_0 = B \text{ modulo } (2\pi).$$

4,065,666

MULTIPLY-DIVIDE UNIT

Chin Tao Wu, North Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 15, 1976, Ser. No. 732,866
Int. Cl.[2] G06F 7/54
U.S. Cl. 364—759 7 Claims

1. A circuit for multiplying or dividing a multiplicand or divisor value stored in a first register means having m stages by or into a multiplier or dividend value stored in a second register means having n stages, where $n \geq m$, said registers having input means and output means, comprising in combination:

means for producing a divide signal when a divide operation is to be performed;

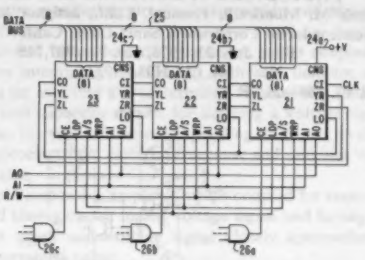
complementing means responsive to said divide signal for selectively complementing the signals from the output means of said first register means;

adder means having m stages including a most significant stage and a least significant stage responsive to signals from the output means of said first register means coupled through said complementing means and the signals from the output means of the m most significant stages of said second register means for producing sum signals and a carry-out signal from the most significant stage, and including means for coupling said divide signal to said least significant stage of said adder as a carry-in signal;

means responsive to said divide signal for storing the carry-out signal in the least significant stage of said second register;

means for shifting the contents of said second register to the next less significant stage in the absence of said divide signal and to the next more significant stage in response to said divide signal, said means for shifting including means responsive to the least significant value in said second register for substituting the sum signals for the contents of the m most significant stages of the second register; and

control means for timing the shifting means including means responsive to said divide signal for shifting the contents of said second register initially to the next more significant stage and finally to the next less significant stage.

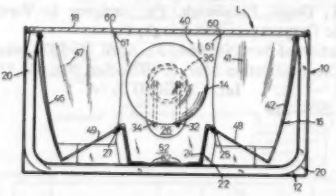


4,065,667

INDIRECT LIGHTING FIXTURE INCLUDING IMPROVED REFLECTOR

Alan J. Ruud, West Allis, Wis., and Ian Lewin, Scottsdale, Ariz., assignors to Donald L. Goulet, Wauwatosa and Alan J. Rudd, West Allis, both of, Wis.

Filed Nov. 13, 1975, Ser. No. 631,514
Int. Cl.[2] F21S 1/02
U.S. Cl. 362—217 9 Claims



1. A light fixture for use with a light emitting lamp for indirect lighting, said light fixture comprising: reflector means surrounding portions of said lamp for reflecting said light against an area of an opposed surface and for distributing said light across said area in a uniformly distributed intensity; and reflector support means including means for supporting said lamp; said reflector means including a plurality of independently angularly positioned reflector panels defining an octagonal configuration around said lamp, and said plurality of reflector panels including opposed generally V-shaped reflector panels extending along opposite sides of said lamp, said V-shaped panels each including a pair of angularly disposed intersecting reflector surfaces, one of said surfaces being positioned generally normal to the direction of the light emitted by the lamp and striking said one surface and the other of said surfaces generally lying in a plane extending radially outwardly from said lamp, at least one of said plurality of indepen-

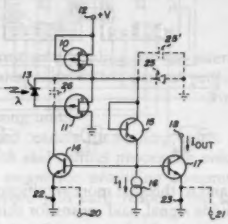
dently angularly positioned reflector panels being positioned diagonally with respect to said one surface, and wherein said plurality of independently angularly positioned reflector panels include opposed end reflector panels disposed adjacent opposite ends of said V-shaped reflector panels, said V-shaped reflector panels and said end reflector panels being joined by diagonally disposed reflector panels.

4,065,668

PHOTODIODE OPERATIONAL AMPLIFIER

Dennis M. Monticelli, Fremont, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed July 22, 1976, Ser. No. 707,745
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—214 P **8 Claims**



1. A composite JFET bipolar transistor photo responsive electronic circuit comprising:

a P-N junction photodiode;

negative feedback means, including a source follower connected JFET having a matched constant current connected JFET as a source load, for maintaining the potential across said photodiode at substantially zero under dark conditions; and

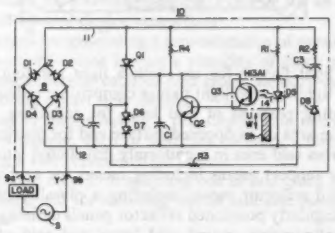
means for replicating the photo current generated in said photodiode in the collector of a bipolar transistor coupled to said photodiode.

4,065,669

SOLID-STATE LIMIT SWITCH UTILIZING INFRARED LINK

George F. Bogel, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 464,731, April 26, 1974, abandoned.
This application Mar. 5, 1976, Ser. No. 664,115
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—229 **5 Claims**



1. A limit switch, comprising:

two terminal circuit means the terminals of which are externally disposed in series circuit relationship with a source of electrical power and a load for electrically disconnecting said load from said source of power under a predetermined condition;

infrared light sensitive switch means connected internally of said circuit means in series circuit relationship with said terminals of said circuit means for electrically providing said predetermined condition to disconnect said load from said source of electrical power when an amount of infrared light striking said infrared light sensitive switch means is of a predetermined value;

infrared light source means connected internally of said circuit means in circuit relationship with said terminals of said circuit means for supplying infrared light to said infrared light sensitive switch means; and

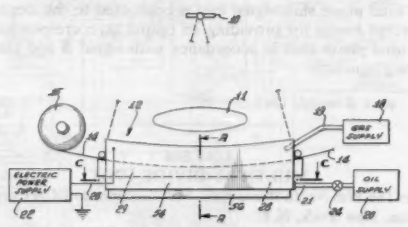
movable shutter means for interposition between said infrared light source means and said infrared light sensitive switch means to thereby control the amount of said infrared light which strikes said light sensitive switch means, said shutter means being movable to a position relative to the position of said light source means and the position of said light sensitive switch means to limit the amount of said infrared light which strikes said light sensitive switch means to said predetermined value, said light sensitive switch means thereafter acting in conjunction with said two terminal circuit means to isolate said load from said source of electrical power, said light sensitive switch means thereafter also acting in conjunction with said two terminal circuit means to provide less infrared light to said light sensitive switch means without further movement of said shutter means to thus latch said load and said source of electrical power opened.

4,065,670

SPHERICAL ELECTRODE X-RAY IMAGING CHAMBER

Arthur Lee Morsell, Van Nuys, Calif., assignor to Xonics, Inc., Van Nuys, Calif.

Filed Oct. 6, 1976, Ser. No. 729,946
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—315 A **14 Claims**



1. In an imaging chamber for a radiographic system, the combination of:

a base;

a first electrode carried in said base;

an X-ray window comprising an outer plate and an inner plate with a conductive surface serving as a second electrode, with said plates in engagement at opposite sides thereof and spaced from each other between said sides by a compression resistant filler;

means for mounting said plates to said base with said inner plate adjacent said first electrode defining a gap therebetween; and

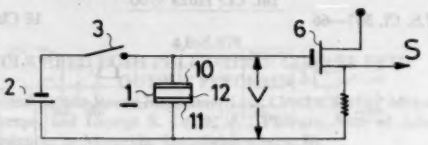
means for sealing said gap adjacent the periphery of said inner plate to maintain a fluid in said gap.

4,065,671

DEVICE FOR DETECTING X-RAY RADIATION

Christian Mayeux; Francois Micheron, and Jean Pierre Vasseur, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 30, 1976, Ser. No. 671,964
Claims priority, application France, Mar. 25, 1975, 75.09320
Int. Cl.[2] G01T 1/22
U.S. Cl. 250—370 13 Claims



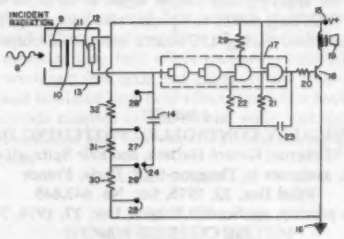
1. A device for detecting X ray radiation comprising: a plate of ferroelectric material positioned for receiving said X ray radiation on one of its major faces; said ferroelectric material being capable of absorbing the major part of said X ray radiation over a given depth; said ferroelectric material having a conductivity increasing under the effect of said X ray radiation; said device further comprising biasing means for providing electrical charges at least at one of the major faces of said plate and charge detection means for sensing the variation in the amount of said electrical charges resulting from the conductivity increase caused by the X ray radiation dose received by said plate; the thickness of said plate being selected to match said depth.

4,065,672

ULTRAVIOLET SENSOR AND EXPOSURE INSTRUMENT

Joseph W. Charpster, 11450 Overbrook Lane, Galena, Ohio 43021

Filed May 17, 1976, Ser. No. 687,379
Int. Cl.[2] G01J 1/42
U.S. Cl. 250—372 4 Claims



1. Apparatus for monitoring animal exposure to sunlight in accordance with a predetermined allowable dosage of ultraviolet radiation, comprising:

a portable housing;

an ultraviolet sensor situate within said housing and including;

an ultraviolet transmitting and visible light absorbing filter positioned for exposure to said sunlight and characterized in absorbi.:g radiation incident thereupon in the visible region while transmitting radiation in the region of about 200 to 400 nanometers;

a converter layer of the phosphorescent type adjacent to said ulraviolet filter for absorbing ultraviolet radiation transmitted therethrough to emit radiation in the visible spectrum;

a second filter adjacent to said converter layer for transmitting said visible radiation and absorbing infrared radiation which may pass through said ulraviolet transmitting filter an said converter layer;

an optoelectronic detector positioned adjacent said second filter and having an electrical response in correspondence with the intensity of incident ulraviolet radiation on said ultraviolet filter; and

a radiation shield enclosing the edges of said ultraviolet transmitting filter, said converter, said second filter and said detector to prevent the entrance thereto of stray radiation;

an exposure monitoring circuit situate within said housing, comprising;

timing circuit means including capacitor means coupled in current integrating relationship with said detector and means for asserting a predetermined value of bias voltage upon said capacitor means, for deriving a voltage signal over an interval of time corresponding with said level of said optoelectronic electrical response and said bias voltage value;

threshhold responsive amplifier means coupled for response to said timing circuit means voltage signal and having an output when said voltage signal closely approaches a predetermined value;

alarm means having a perceptible output in the presence of said threshhold responsive amplifier means output; and

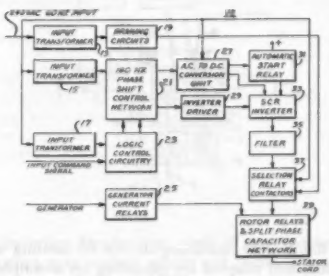
power supply means situate within said housing for powering said exposure monitoring circuit.

4,065,673

ROTOR CONTROLLER SYSTEMS FOR X-RAY TUBES

Louis L. Fiocca, Bensenville, Ill., assignor to Advanced Instrument Development, Inc., Melrose Park, Ill.

Filed Aug. 4, 1975, Ser. No. 601,647
Int. Cl.[2] H05G 1/70
U.S. Cl. 250—402 7 Claims



1. A system operable from an alternating current source for controllably providing power to an induction motor for driving rotating anodes of X-ray tubes; means for receiving the power at a line frequency and multiplying the line frequency; drive means for driving the motor and hence the anode; a phase shift network for selectively shifting the phase of the multiplied line frequency; said drive means being responsive to said phase shift network for selectively driving said motor at a first and at a second selected running speed and for accelerating said motor to the selected running speed dependent on the output of said phase shift network; and logic circuitry comprising first means for selectively connecting said phase shift network to select the X-ray tube anode to be rotated, second means for selecting the speed at which the anode is to be rotated, and acceleration timer means for controlling the length of time the drive means accelerates an anode dependent on the anode selected and the selected running speed.

4,065,674

ROTARY-ANODE X-RAY TUBE

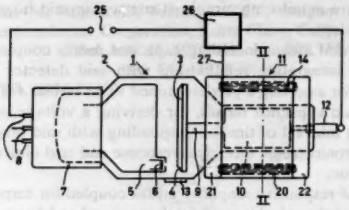
Herman Gerard Lakerveld, and Johan Adriaan Rietdijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,675

Claims priority, application Netherlands, Oct. 13, 1975, 7511984

Int. Cl.[2] H05G 1/70

U.S. Cl. 250—406 4 Claims



1. An X-ray tube comprising a rotary anode and a drive motor which comprises a rotor which is rigidly connected to the anode and a stator which is arranged about the rotor, characterized in that the stator is composed of a plurality of radially movable sector elements.

4,065,675

FLOW MONITORING DEVICES

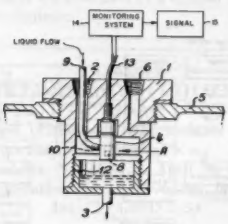
Roy Charles Gold, London, England, assignor to The British Petroleum Company Limited, Sunbury-on-Thames, England

Filed June 3, 1976, Ser. No. 692,388

Claims priority, application United Kingdom, June 11, 1975, 25004/75

Int. Cl.[2] G01N 21/26; G08B 21/00

U.S. Cl. 250—576 5 Claims



1. A liquid flow indicating device for sensing intermittent liquid flow and adapted for mounting on a sample-collecting container and comprising a flow monitor mounted on top of the container, the flow monitor having means forming a chamber having an inlet for the entrance of liquid and an outlet spaced from said inlet for the flow of said liquid out of said chamber, said liquid flowing along a path defined at its beginning by said inlet and at its end by said outlet, a probe mounted intermediately along the path in said chamber and comprising an energy transmitter and an energy receiver in spaced apart relation within said chamber, said transmitter being disposed on the transversely opposite side of the liquid path from said receiver said transmitter and said receiver having a passageway therebetween which includes said path and which permits the flow of said liquid along said path and between said transmitter and said receiver, whereby the flow of liquid along said path alters the energy transmitted across the path from said transmitter to said receiver, and the outlet receiving the liquid from the chamber and communicating with the container to deliver the liquid to the container and drain the chamber when no liquid is delivered to the inlet, a signal being generated when liquid is in the chamber between the transmitter and the receiver to indicate the intermittent flow of liquid through the chamber and the filling of the container.

4,065,676

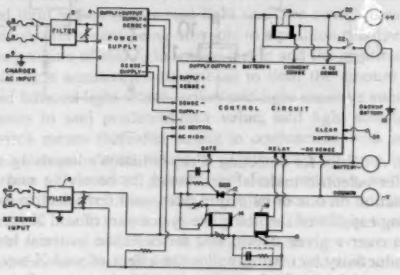
BATTERY BACKUP FOR AC POWERED DC SUPPLY

Jack Elias, Lansdale, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 2, 1976, Ser. No. 692,127

Int. Cl.[2] H02J 9/00

U.S. Cl. 307—66 10 Claims



1. A backup system for supplying backup DC power to replace AC supplied DC power to a load during a failure of the AC supplied DC power comprising

a pair of output terminals,

a backup DC source,

switching means for selectively connecting said DC source across said output terminals,

control means for selectively operating said switching means in response to an input signal,

AC line monitoring means including means for checking the frequency of an AC line signal used for the AC supplied DC power, means for checking the rise time of said AC line signal and means responsive to said means for checking the frequency and said means for checking the rise time to produce an output signal indicative of an error in either the rise time or frequency of said AC line signal and

means for applying said output signal as an input signal to said switching means to operate said switching means to connect said backup DC source across said output terminals.

4,065,677

ELECTRICALLY CONTROLLED SWITCHING DEVICE

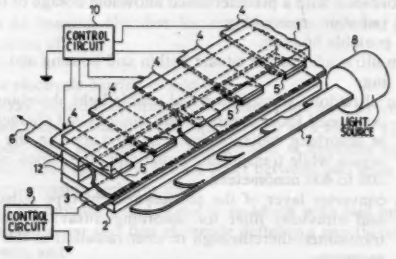
Francois Micheron; Gerard Doriath, and Eric Spitz, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 23, 1975, Ser. No. 643,645

Claims priority, application France, Dec. 27, 1974, 74.42640

Int. Cl.[2] H01H 1/04

U.S. Cl. 307—112 14 Claims



1. An electrically controlled switching device comprising a

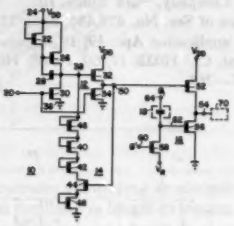
frame of insulator material and at least one movable member; said movable member having in relation with said frame at least two rest positions; said movable member comprising a dielectric body carrying a permanent electric charge; said frame being provided with at least two distinct electrically conductive pads for causing said movable member to be retained by electrostatic influence, in any one of said rest positions; electric bias means being connected to the said conductive pads for causing said movable member to switch across the gap separating said conductive pads.

4,065,678

CLAMPED PUSH-PULL DRIVER CIRCUIT WITH OUTPUT FEEDBACK

Edmund Arthur Reese, Sugarland, Tex.; Charles Shelley Meyer, Tempe, and George S. Leach, Jr., Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed July 2, 1976, Ser. No. 702,366
Int. Cl.[2] H03K *5/08, 19/08, 19/40*
U.S. Cl. 307—237 **3 Claims**



1. A circuit for producing a limited output voltage comprising:

inverter means for producing a first voltage at a first node in response to an input voltage applied to said inverter means;

output means coupled to said first node for producing a second voltage at a second node in response to said first voltage; and

regulator means coupled to said first node and to said second node for limiting said first voltage in response to said second voltage, said regulator means including a plurality of insulated gate field effect transistors coupled in series between said first node and a first voltage conductor, one of said insulated gate field effect transistors having a gate electrode coupled to said second node, and the other of said insulated gate field effect transistors being diode-connected.

4,065,679

DYNAMIC LOGIC SYSTEM

Richard H. Heeren, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed May 7, 1969, Ser. No. 822,520
Int. Cl.[2] H03K *17/60, 19/08, 19/20, 19/40*
U.S. Cl. 307—251 **2 Claims**

1. In combination;

a field effect transistor having a source, a drain and gate for providing an impedance condition between said source and said drain;

a first controlled switch having a first control terminal and first and second controlled terminals, said switch being responsive to a signal applied to said control terminal for altering the impedance between said first and second controlled terminals;

means for connecting said source and drain to said first and second controlled terminals providing first and second nodes, respectively;

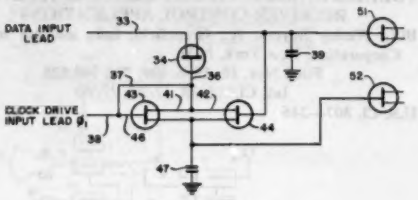
a second controlled switch having a second control terminal and third and fourth controlled terminals;

means for connecting said second control terminal to said first node;

a first capacitor having first and second electrodes;

means for connecting said second node to said second electrode;

means for providing a clock signal between said first electrode and said first node;



means for applying said clock signal to said first control terminal;

means for applying an information signal to said third controlled terminal;

a second capacitor connected between said first electrode of said first capacitor and said fourth controlled terminal; and

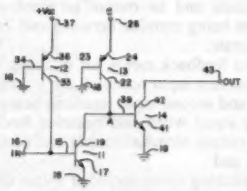
means for connecting said fourth controlled terminal to said gate of said field effect transistor.

4,065,680

COLLECTOR-UP LOGIC TRANSMISSION GATES

Lewis K. Russell, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 487,756, July 11, 1974, abandoned.
This application May 12, 1976, Ser. No. 685,503
Int. Cl.[2] H03K *19/40*
U.S. Cl. 307—214 **1 Claim**



1. In an inverting bipolar logic gate of the type having an input, an output, gate control, supply and common terminals, a logic circuit having PNP and NPN conductivity type transistors including, a switching transistor, a source transistor having opposite conductivity from and associated with said switching transistor and having a spaced relationship thereto capable of injected carrier communication with said switching transistor, said transistors each having collector, base and emitter electrodes, said collector of the switching transistor connected to the output terminal, and defining a gate logic node, the base to the input terminal and the emitter to the common terminal, and wherein the collector of the source transistor is connected to the base of the switching transistor, the source transistor base is connected to common and the emitter is connected to the supply terminal,

and gate switching means connected between said gate logic node and said gate control input comprising solely a single gate switching transistor having collector, base and emitter electrodes having an opposite conductivity from said switching transistor, the collector of said gate switching transistor being of differing conductivity from said

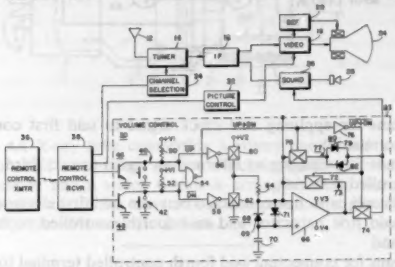
switching transistor collector and connected to said gate logic node, said base connected to the common terminal and said emitter to said gate control input wherein said gate switching transistor is responsive to first and second logic levels at said gate control input for driving said gate logic node to first and second states and causing the gate to assume open and closed states from input to output.

4,065,681

VOLTAGE STORAGE CIRCUIT USEFUL IN TELEVISION RECEIVER CONTROL APPLICATIONS

Billy Wesley Beyers, Jr., Greenfield, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,628
Int. Cl.[2] H03K *17/22, 17/60*
U.S. Cl. 307—246 **15 Claims**



1. Apparatus for controlling a utilization means, comprising:
a source of fixed potential;
a circuit point;
means for selectively coupling said source of fixed potential to said circuit point;
capacitive means for storing a DC control voltage;
DC impedance means for coupling said circuit point to said capacitive means to thereby develop said DC control voltage;
operational amplifier means having first and second input terminals and an output terminal, said DC impedance means being coupled between said first and second input terminals;
negative feedback means for coupling said output terminal to said first input terminal, the voltages developed at said first and second input terminals being maintained substantially equal when said negative feedback means couples said output terminal to said one of said first input terminals, and
first switching means included within said negative feedback means for selectively decoupling said output terminal from said first input terminal when said source of fixed potential is coupled to said circuit point.

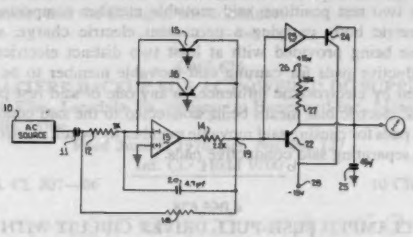
4,065,682

LOGARITHMIC CONVERTER

Ronald C. Evans, Binghamton, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.

Filed Mar. 22, 1976, Ser. No. 669,134
Int. Cl.[2] H02M *7/00;* **G06G** *7/24;* **G01R** *19/04*
U.S. Cl. 307—261 **14 Claims**

1. A peak rectifying system for an AC signal comprising an amplifier of said signal, said amplifier having a bipolar output, a bipolr circuit including a first transistor and a second transistor, means biasing said transistors approximately to cut-off, a storage capacitor directly connected
to an electrode of said first transistor in a collector-emitter circuit thereof,
to a corresponding electrode of said second transistor in a collector-emitter circuit thereof, and
to a ground, a source of constant current of one polarity connected to both said corresponding electrodes, and a source of voltage of polarity opposite said one polarity connected to other electrodes in collector-emitter circuits



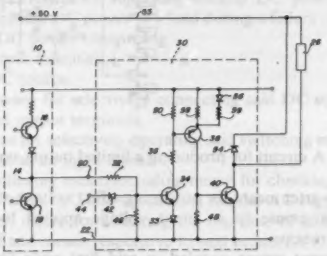
of said transistors, whereby a peak rectified signal is available at said storage capacitor.

4,065,683

CIRCUITRY FOR INDUSTRIAL LOGIC SYSTEMS

Geoffrey Clarke, Blunsdon, near Swindon, England, assignor to Square D Company, Park Ridge, Ill.

Continuation of Ser. No. 478,486, June 12, 1974, abandoned.
This application Apr. 19, 1976, Ser. No. 678,287
Int. Cl.[2] H03K *17/60, 19/08;* **H02H** *3/00*
U.S. Cl. 307—264 **5 Claims**



1. A device for use in an industrial logic system for translating a low level input signal into a high level output signal comprising:
A. a logic gate adapted to both sink current and source an output signal less than 7 milli-watts, the gate including:
1. a first transistor having an emitter and a collector;
2. a second transistor having an emitter and a collector, the collector being connected to the emitter of the first transistor, the connection providing the output signal of the logic gate when the first transistor is conducting and the second transistor is not conducting; and
3. a first voltage supply connected across the collector of the first transistor and the emitter of the second transistor;
B. a second voltage supply;
C. a load; and
D. an output driver connected in series with the load across the second voltage supply, the driver including:
1. a third transistor connected to be controlled only by the output signal from the logic gate by having a base connected in a base circuit to the output of the logic gate so that the third transistor is in a non-conductive state when the logic gate is sinking current or when the base circuit is inadvertently open or grounded;
2. an input terminal connectible to a common rail through a diode to clamp the base circuit and make the third transistor non-conductive and thus non-responsive to the output of the logic gate;
3. a resistor connected to the third transistor to reduce the input impedance of said third transistor and thereby increase the sensitivity of the third transistor; and

4. means for responding to the conduction of the third transistor to cause the ouput driver to emit an output signal greater than 100 watts and responsive to non-conduction of the third transistor to prevent the output from emitting an output signal when the logic gate does not source a current.

4,065,684

PIEZOELECTRIC RESONATOR FOR TIMEPIECES AND METHOD FOR MAKING SAME

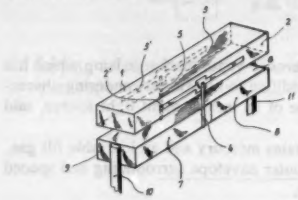
Jean Hermann, Neuchatel, and Hubert Choffat, St. Blaise, both of Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Aug. 4, 1975, Ser. No. 601,634

Claims priority, application Switzerland, Aug. 7, 1974, 10835/74

Int. Cl.[2] H01L *41/04*

U.S. Cl. 310—351 **3 Claims**



1. A piezoelectric resonator comprising an elongated piezoelectric crystal rod that oscillates in length-extension, a casing within which said rod is disposed and a first pair of conductive wires secured tangentially to the middle of opposite long faces of the rod and extending perpendicular to the length of the rod, the wires supporting the rod in the casing being straight and of a length substantially less than the length of the crystal rod, the faces of the rod to which the wires are secured being partially metallized, a support constituted by an elongted piece of ceramic material of about the same size and shape as and parallel to the crystal rod, said wires of the said first pair of wires being secured at their one ends to said support and at their other ends to said crystal rod, and a second pair of conductive wires secured to the ends of the support and supporting the support and rod in the casing, the last-named wires extending in sealed relationship through the casing to the exterior of the casing, the side faces of the support being metallized on the one hand between one wire of the first pair of wires and one wire of the second pair of wires, and on the other hand between the other wire of the first pair of wires and the other wire of the second pair of wires thereby to complete electrically conductive paths between the metallized area on one side of the rod and one of the wires of the second pair of wires, and the metallized area on the other side of the rod and the other wire of the second pair of wires.

4,065,685

INTERPOLATING STEP MOTOR SYSTEM WITH REDUCTION DRIVE INTERFACE

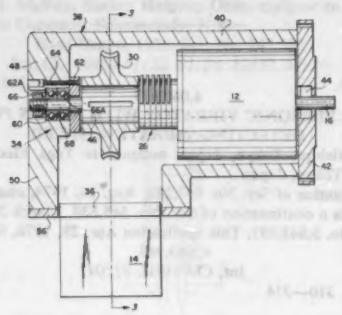
Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Salem, Mass.

Filed Aug. 10, 1976, Ser. No. 713,310

Int. Cl.[2] H02K *37/00*

U.S. Cl. 310—49 R **10 Claims**

1. In combination with first and second step motors each having field and rotor elements and energizing means for simultaneously stepping both of the motors, means for effecting advancement of the rotor element of said first step to an interpolated position between steps, comprising reduction gear means drivingly connecting the rotor element of said second step motor to the field element of said first step motor for stepped advancement of the field element through steps



smaller than the steps through which the rotor elements are advanced.

4,065,686

MULTIPHASE FULL-WAVE RECTIFIER ASSEMBLY

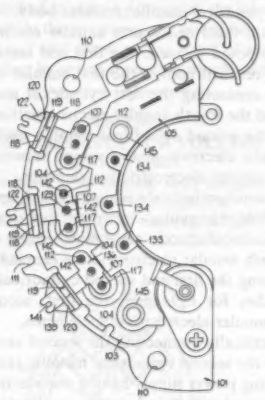
Alan Raymond Moore, Aldridge, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 22, 1976, Ser. No. 744,173

Claims priority, application United Kingdom, Dec. 20, 1975, 52464/75

Int. Cl.[2] H02K *11/00*

U.S. Cl. 310—68 D **19 Claims**



1. A multiphase full-wave rectifier assembly comprising a first plate, a first set of diodes carried by said first plate, a second plate disposed substantially parallel to said first plate and having holes therein, a terminal of each diode of said first set extending through a respective one of the holes in said second plate, a second set of diodes carried by said second plate, an electrical connector electrically interconnecting said terminal of each said diode of said first set with a respective diode of said second set and being adapted for connection to a respective phase to be rectified, a support structure including an electrically insulating body having recesses therein, a third set of diodes disposed in the recesses respectively, the recesses being shaped so as to hold the diodes of said third set in predetermined relative positions, each said diode of said third set having a body and a pair of terminals, one terminal of each said diode of said third set being electrically connected with a respective one of said electrical connectors, and a common

electrical connector electrically connecting together the other terminals of said diodes of said third set.

4,065,687

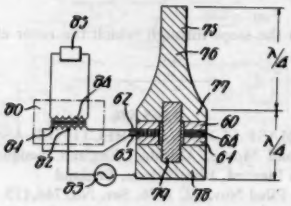
SUPERSONIC VIBRATOR WITH MEANS FOR DETECTING VIBRATING SPEED

Shoji Mishiro, Tokyo, Japan, assignor to Taga Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 497,282, Aug. 14, 1974, abandoned, which is a continuation of Ser. No. 345,530, March 28, 1973, Pat. No. 3,843,897. This application Apr. 28, 1976, Ser. No. 680,983

Int. Cl.[2] H01L *41/04*

U.S. Cl. 310—314 1 Claim



1. A supersonic vibrator comprising:

a first cylindrical metallic resilient body,

a second cylindrical metallic resilient body,

first, second, third and fourth annular electrostrictive elements disposed between the first and second cylindrical metallic resilient bodies, the first annular electrostrictive element contacting the first cylindrical metallic resilient body and the fourth annular electrostrictive element contacting the second cylindrical metallic resilient body,

a first annular electrode plate disposed between the first and second annular electrostrictive elements,

a second annular electrode plate disposed between the second and third annuular electrostrictive elements,

a third annular electrode plate disposed between the third and fourth annular electrostrictive elements,

means joining the first and second cylindrical metallic resilient bodies for tightening the first, second, third and fourth annular electrostrictive elements,

means electrically connecting the second annular electrode plate to the second cylindrical metallic resilient body,

an energizing power supply having one electrode connected to the second cylindrical metallic resilient body and other electrodes connected to the first and third annular electrode plates,

the axial length of the first cylindrical metallic resilient body being substantially one-fourth of the wavelength of the intrinsic resonant frequency of the vibrator;

the axial length of the second cylindrical metallic resilient body when combined with the axial lengths of the first, second, third and fourth annular electrostrictive elements and the axial lengths of the first, second and third annular electrode plates being substantially one-fourth of the wavelength of the intrinsic resonant frequency of the vibrator,

means for detecting the difference of the current flowing from the first annular electrode plate to the first and second annular electrostrictive elements and the current flowing from the third annular electrostrictive element to the third and fourth annular electrostrictive elements as representative of the vibrating speed of the vibrator.

4,065,688

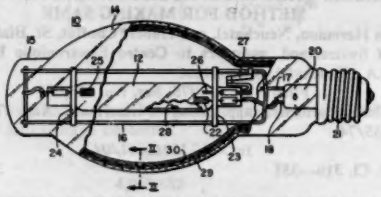
HIGH-PRESSURE MERCURY-VAPOR DISCHARGE LAMP HAVING A LIGHT OUTPUT WITH INCANDESCENT CHARACTERISTICS

William A. Thornton, Cranford, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1977, Ser. No. 782,279

Int. Cl.[2] H01J *61/20, 61/34, 61/48*

U.S. Cl. 313—25 11 Claims



1. A high-pressure mercury-vapor discharge lamp which has a light output that is modified to have color-rendering characteristics similar to those of an incandescent light source, said lamp comprising:

an arc tube that contains mercury and an ionizable fill gas,

a light-transmitting outer envelope surrounding and spaced from said arc tube,

means supporting said arc tube in predetermined position within said outer envelope and providing an electric circuit for connecting the arc tube to a power source,

means carried by said outer envelope for converting radiations of selected wavelength which are produced by said arc tube into selected radiations of longer wavelength and thereby modifying the color-rendering characteristics and chromaticity of the light generated by said arc tube when the lamp is energized,

said modifying means comprising (a) a first layer of luminescent material that is disposed on the inner surface of said outer envelope and absorbs radiation in the blue-violet region of the spectrum which is produced by the arc tube and converts such radiations into green and red radiations, and (b) a second layer of luminescent material that extends over said first layer and absorbs ultraviolet radiations produced by said arc tube and converts such radiations into red radiations, said second layer of luminescent material being transmissive of blue-violet radiations produced by the arc tube so that such radiations can interact with and be converted by said first layer of luminescent material.

4,065,689

DUAL FILAMENT X-RAY TUBE

Viktor W. Pleil, Wheaton, Ill., assignor to Picker Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 528,156, Nov. 29, 1974, abandoned. This application Dec. 31, 1975, Ser. No. 645,784

Int. Cl.[2] H01J *35/10*

U.S. Cl. 313—56 9 Claims

1. An X-ray tube comprising:

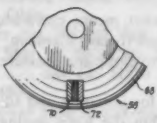
a. a cathode structure including means for controllably emitting first and second beams of electrons;

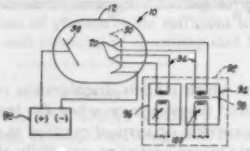
b. an anode structure which defines a target for emitting X-rays in response to the impingement of electrons;

c. high tension means for applying a tube operating voltage potential between the anode structure and the cathode structure to cause electrons from the respective beams to flow to and impinge upon the target region; and,

d. said cathode structure including means for focusing the first and second beams of electrons onto first and second

non-uniformly distributed spots of substantially the same size and configuration on said target and in partially over-





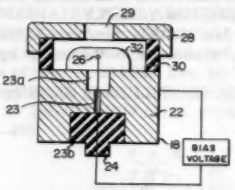
lapping relation to thereby provide a relatively uniform distribution of electrons striking the target area.

4,065,690

X-RAY TUBE WITH A CONTROL GRID

Shigeo Maeyama, Fujisawa, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 26, 1977, Ser. No. 762,815
Claims priority, application Japan, Jan. 29, 1976, 51-8153[U]
Int. Cl.[2] H01J *35/00*
U.S. Cl. 313—57 **2 Claims**



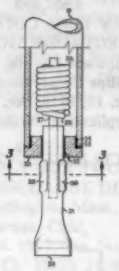
1. A grid-equipped X-ray tube including a cathode having a cathode body one end of which is hermetically sealed to one end of an air-sealed envelope and on the other end of which a focusing electrode means is mounted, an anode one end of which is hermetically sealed to the other end of the envelope and on the other end of which a target facing the focusing electrode means is mounted, and a control grid disposed between the cathode and the anode, the improvement in which said focusing electrode means comprises a first focusing electrode having a stepped through bore, a filament insulatingly mounted on the first focusing electrode and part of which extends out through the bore, a second focusing electrode mounted on the first focusing electrode through an insulator and having an opening toward which the filament extends, the second focusing electrode having a potential level the same with that of the filament electrode, and said control grid disposed between the first focusing electrode and the second focusing electrode to cover the filament and each end of which is electrically connected to the first focusing electrode.

4,065,691

CERAMIC LAMP HAVING ELECTRODES SUPPORTED BY CRIMPED TUBULAR INLEAD

Charles I. McVey, Shaker Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,552
Int. Cl.[2] H01J *61/22, 61/28, 61/30, 61/36*
U.S. Cl. 313—174 **8 Claims**



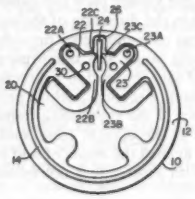
1. An electric discharge lamp comprising:
a tubular light-transmitting ceramic envelope having closures and thermionic electrodes in its ends and containing an ionizable filling,
a closure and electrode assembly at one end of said envelope comprising a tubular metal inlead conductor hermetically sealed to said envelope and extending externally thereof, and an electrode located within the envelope mounted on a metal shank which projects into the tubular inlead and which is locked in place by crimping the inlead about it at a place outside the envelope, said inlead being closed at its outer end and said shank ending short of said closed end and receiving its entire support through said crimping.

4,065,692

SPARK GAP ASSEMBLY FOR VOLTAGE SURGE ARRESTERS

Joseph C. Osterhout, Bloomington, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1976, Ser. No. 661,593
Int. Cl.[2] H01J *17/00, 21/00*
U.S. Cl. 313—325 **4 Claims**



1. A spark gap assembly comprising: a stack of insulating plates, first, second and third plates of said stack having opposing first and second surfaces with said first surface having a raised portion and said second surface having a recess, said raised portion of said first surface of said first plate located within said recess of said second surface of said second plate, said raised portion of said first surface of said second plate located within said recess of said second surface of said third plate; a pair of electrodes disposed on and affixed to individual ones of said stack of plates on a single one of said surfaces thereof and defining a spark gap between said pair of electrodes; said pair of electrodes having a piece of ionizing material disposed therebetween, said piece of ionizing material

being affixed within a recess of said surface to which said electrodes are affixed, said pair of electrodes having a first pair of opposing points contacting said preionizer and a second pair of opposing portions that face each other at a location removed from said preionizer, said second pair of portions being spaced a predetermined distance defining a spark gap between said electrodes.

4,065,693

CATHODE RAY TUBE COLOR SELECTION ELECTRODE MOUNT

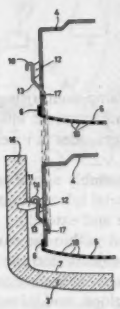
Johannes Henricus Nicolaas Gijrath, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 10, 1976, Ser. No. 722,097

Claims priority, application Netherlands, Sept. 18, 1975, 7510970

Int. Cl.[2] H01J *29/07, 29/02*

U.S. Cl. 313—406 **4 Claims**



1. A cathode ray tube for displaying color images, comprising an evacuated envelope having a display window portion, a display screen on said window portion, means for generating at least two electron beams for energizing said screen, said display window portion forming part of the wall of said envelope and being provided with inwardly projecting studs positioned on an upright edge portion thereof, a color selection electrode adjacent to and spaced from the display screen, a frame supporting the color selection electrode and having side wall portions extending substantially parallel to said upright edge portions, strip shaped resilient elements having one end thereof secured to the frame and having their free other ends extending away from the frame in the direction of the studs, the free end of each of said resilient elements being provided with an aperture for engaging said studs and comprising a lug portion limiting movement of said free end in a direction transverse to the stud and comprising a second portion projecting through an aperture in that part of the supporting frame which extends substantially parallel to the upright edge, said seocnd portion being biased to press against the inside of said supporting frame when the color selector electrode is not mounted in the cathode ray tube.

4,065,694

REGENERATIVE-CYCLE INCANDESCENT LAMP CONTAINING SnI_4 ADDITIVE

Avinash D. Kulkarni, Montclair, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 552,830, Feb. 25, 1975, abandoned. This application Dec. 22, 1975, Ser. No. 643,277

Int. Cl.[2] H01K *1/50*

U.S. Cl. 313—222 **6 Claims**

1. A regenerative-cycle incandescent lamp of elongated configuration that is adapted to be operated at a selected wattage and have a nominal design life in excess of 1000 hours when operated at said wattage, said lamp comprising;

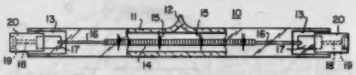
a sealed envelope of light-transmitting material that contains

a coiled filament which is composed essentially of tungsten and is supported in longitudinally-extending position within said envelope,

a pair of spaced conductor means extending through said envelope and connected to said filament,

an inert gas within said envelope at a pressure of at least 1000 torr, and

means in said envelope for initiating and sustaining a tungsten-iodine cycle within the lamp during the operation



thereof which inhibits discoloration of the envelope by vaporized tungsten even when the lamp is operated in a non-horizontal or vertical position at said selected wattage, said means consisting essentially of SnI_4 in an amount sufficient to provide from about 0.05 to 0.21 micromole per ml. of lamp volume of elemental iodine within the envelope when the lamp is operated at said selected wattage and the SnI_4 is subjected to the heat and radiant energy generated by the energized incandescent filament.

4,065,695

CATHODE RAY TUBE SCREEN HAVING CHARGE-RETAINING LAYER APERTURED IN REGISTRATION WITH COLOR ELEMENTS

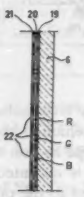
Jan van der Waal, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 30, 1976, Ser. No. 653,921

Claims priority, application Netherlands, Apr. 11, 1975, 7504324

Int. Cl.[2] H01J *29/32, 31/20*

U.S. Cl. 313—466 **2 Claims**



1. A cathode-ray tube for displaying color pictures comprising a shadow mask having a large number of apertures, a display screen having a large number of regions luminescing in different colors, and electron gun means to generate a number of electron beams, each electron beam being arranged to impinge on luminescent regions of a respective color by means of the apertures in the shadow mask, said display screen being covered on the side facing said electron gun means with a continuous thin metal layer, said metal layer on the side facing said electron gun means being provided with an electron-absorbing and charge-retaining layer having a low electrical conductivity and having apertures which are in registration with the luminescent regions.

4,065,696

CATHODE-RAY TUBE

Bernard L. Steierman, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 799,902, Feb. 17, 1969. This application Mar. 29, 1974, Ser. No. 456,564

Int. Cl.² H01J *31/00*

U.S. Cl. 313—480 **9 Claims**

1. A cathode-ray tube comprising a glass funnel portion, a glass faceplate sealed thereto, a fluorescent screen on the inner surface of said faceplate, and an electron gun disposed within said sealed tube, said tube having the property of absorbing X-rays emitted from within the tube, at least one of said glass members being formed from a glass having as an essential ingredient an amount of yttrium oxide sufficient to impart to said glass member said property of absorbing said X-rays.

4,065,697

CATHODE-RAY TUBE

Bernard L. Steierman, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 17, 1969, Ser. No. 799,902

Int. Cl.² H01J *31/00*

U.S. Cl. 313—480 **5 Claims**

1. A cathode-ray tube comprising a glass funnel portion, glass faceplate sealed thereto, a fluorescent screen on the inner surface of said faceplate, and an electron gun disposed within said sealed tube, at least said faceplate being formed from a soda-potash-barium or a soda-potash-lead-barium glass, said glass containing cerium oxide in an amount not exceeding 1 weight percent to protect against X-ray browning and also containing as an essential ingredient up to 20 weight percent SrO, sufficient to impart improved absorption of X-radiation emitted from within the tube in the range of wavelengths between about 0.5 and 0.7A, said glass having a fiber softening point of from about 625° to about 700° C and an annealing point of from about 425° to about 525° C.

4,065,698

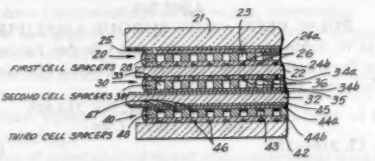
GAS DISCHARGE DISPLAY DEVICE INCLUDING PLURALITY OF DISCHARGE PANEL UNITS WITH INTERMEDIATE LIGHT ABSORBING PLATES

Kenichi Owaki; Shizuo Ando, and Norihiko Nakayama, all of Kobe, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 316,020, Dec. 18, 1972, abandoned. This application Sept. 2, 1976, Ser. No. 719,700

Int. Cl.² H01J *61/35, 61/42*

U.S. Cl. 313—489 **2 Claims**



1. A gas discharge display device having a display surface side, said gas discharge display device comprising

a plurality of intermediate plates having light absorbing characteristics, each of the intermediate plates having a pair of spaced opposite surfaces;

a plurality of discharge panel units in stacked relation to each other, each of the intermediate plates being positioned between a corresponding one of the discharge panel units and a corresponding next-adjacent one of the discharge panel units, each of the intermediate plates having one electrode on one of the surfaces thereof for addressing one of the discharge panel units and another electrode on the other of the surfaces thereof for addressing another of the discharge panel units, each of the discharge panel units having an envelope including an intermediate plate, a discharge sustaining gas therein, a discharge space formed therein, a rear side wall in the discharge space and addressable row and column electrodes on opposite sides of the discharge space, at least one of which is on the intermediate plate; and

phosphorescent material on the rear side wall in the discharge space on one of the discharge panel units on the display surface side of the device, the phosphorescent material emitting visible light rays upon excitation by discharged light from the discharge panel units whereby the phosphorescent material emits light at an intensity proportional to the volume of light reaching said phosphorescent material from each of the discharge spaces through the intermediate plates.

4,065,699

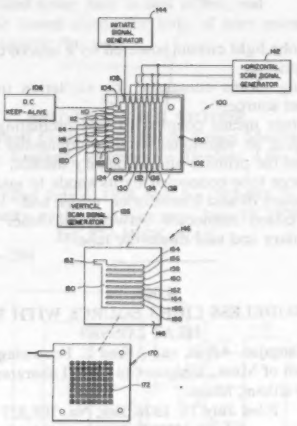
CATHODE ASSEMBLY FOR TWO-DIMENSIONAL SCANNED GAS DISCHARGE DISPLAY PANEL

Albert W. Baird, III, Burlington, Mass., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 24, 1977, Ser. No. 761,931

Int. Cl.² H05B *37/00*

U.S. Cl. 315—169 TV **8 Claims**



1. An improved cathode assembly for providing a two dimensional scan in gas discharge display apparatus comprising:

a. a plurality of first cathode elements disposed end to end in close adjacent spaced relationship along a first path;

b. a plurality of second cathode elements disposed side by side in parallel spaced relationship adjacent one side of said first path of said first cathode elements;

c. a plurality of insulating spacers disposed on said second cathode elements, said spacers each extending from between adjacent ones of said first cathode elements across said plurality of second cathode elements to form a plurality of channels from said first cathode elements across said second cathode elements;

d. means for causing an ionizable gas adjacent one of said first cathode elements to ionize;

e. first scan signal generator means operably connected to said first cathode elements for sequentially applying an electrical potential to said first cathode elements to cause the ionization to move from adjacent said one of said first cathode elements to the next adjacent of said first elements and thence to the next adjacent of said first elements seriatim until the ionized gas is disposed adjacent a selected one of said first cathode elements;

f. second scan signal generator means operably connected to said second cathode elements for sequentially applying an electrical potential to said second cathode elements to cause the ionization to move from adjacent said selected

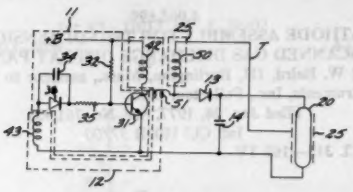
one of said first cathode elements to the portion of the next adjacent of said second cathode elements disposed within one of said channels and thence to the next adjacent of said second cathode elements within said channel seriatim until the ionized gas is disposed adjacent a selected one of said second cathode elements.

4,065,700

D. C. POWERED STROBE LIGHT

Theodore Liebman, 8201 Henry Ave., Philadelphia, Pa. 19128

Filed July 6, 1976, Ser. No. 702,917
Int. Cl.² H05B *37/00*
U.S. Cl. 315—241 R **4 Claims**



1. A strobe light circuit powered by a source of direct current, comprising:

oscillating means connected for excitation to said direct current source;

transformer means coupled to said oscillating means and including an additional winding connected between the ends of the primary and secondary thereof;

a discharge tube connected by its anode to said end of said secondary of said transformer means; and

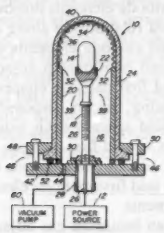
trigger means connected between the other end of said secondary and said discharge tube.

4,065,701

ELECTRODELESS LIGHT SOURCE WITH REDUCED HEAT LOSSES

Paul O. Haugsjaa, Acton, and Alfred E. Feuersanger, Framingham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed July 14, 1976, Ser. No. 705,327
Int. Cl.² H05B *41/16, 41/24*
U.S. Cl. 315—248 **9 Claims**



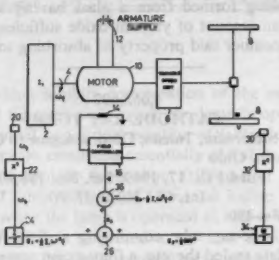
1. In an electrodeless light source having a source of power at a high frequency, an electrodeless lamp having an envelope made of a light-transmitting material and a volatile fill material emitting light upon breakdown and excitation and a termination fixture coupled to the source, the fixture having an inner conductor and an outer conductor disposed around the inner conductor, the lamp being disposed in the region of the first ends of the conductors and the source being coupled to the second ends of the conductors so that the lamp forms a termination load for the source, the fixture including means for matching the impedance of the lamp during breakdown and excitation to the output impedance of the source, an improvement comprising means for restricting the flow of heat from the lamp envelope to the region between the conductors.

4,065,702

DRIVE SYSTEM FOR HIGH INERTIA LOAD

Daniel Locker, 18 Bialik Street, and Moshe Miller, Sanhedria Murhevet 124/5, both of Jerusalem, Israel

Filed Mar. 23, 1976, Ser. No. 669,664
Claims priority, application Israel, July 31, 1975, 47843
Int. Cl.² H02K *7/02*
U.S. Cl. 318—161 **10 Claims**



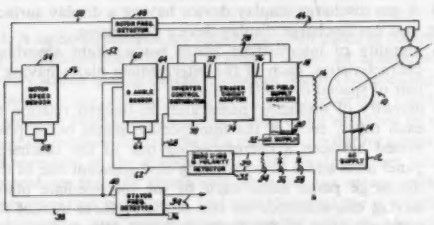
1. A drive system comprising: a flywheel; a prime-mover for setting the flywheel into motion and for maintaining the motion thereof during the operation of the drive system; a driven device driven by the flywheel; a bidirectional variable speed unit coupling the flywheel to the driven device for controlling the speed thereof during the operation of the drive system such that when the driven device is accelerating it draws energy from the flywheel, and when it is decelerating it returns energy to the flywheel; and a control system automatically controlling the prime-mover to supply sufficient energy to the flywheel to make up or losses during the operation of the drive system said control system being an energy-responsive one and including: first energy measuring means for continuously measuring the energy of the flywheel; second energy measuring means for continuously measuring the energy of the driven device; summing means for summing the two measurements and for subtracting the sum from a reference value to produce a control signal corresponding to the difference between said sum and reference values; and control means for controlling the prime-mover in accordance with said control signal.

4,065,703

PULSE EXCITATION TORQUE AMPLIFIER

David W. Schlicher, Minneapolis, and Liboslav Fabian, Brooklyn Park, both of Minn., assignors to Electric Machinery Mfg. Company, Minneapolis, Minn.

Filed Nov. 22, 1976, Ser. No. 743,695
Int. Cl.² H02P *1/46*
U.S. Cl. 318—176 **16 Claims**



1. A torque amplifier control circuit for pulling a synchronous motor rotor having a field winding with the stator rotating field comprising:

means for detecting motor speed and generating a first signal representative thereof;

means for detecting the zero crossings of the induced field current waveform and generating a second signal representative of said zero crossings;

means for determining the load angle of the motor and generating a third signal representative thereof; and

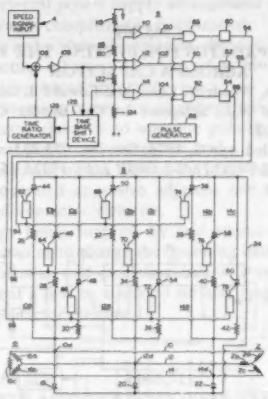
means responsive to said first, second and third signals for applying a DC voltage to said field winding at said zero crossings when said motor speed exceeds a predetermined value, and removing said DC voltage at predetermined load angles whereby said motor is pulled into synchronism within several rotor slip cycles.

4,065,704

STATIC SPEED CONTROL CIRCUIT FOR POLYPHASE INDUCTION MOTORS

Francis M. Bailey, Roanoke, Va., assignor to General Electric Company, New York, N.Y.

Filed Sept. 10, 1976, Ser. No. 722,190
Int. Cl.² H02P 5/36
U.S. Cl. 318—237 **18 Claims**



1. A rotor current control circuit adapted to modify the speed of a wound rotor motor by modifying the effective resistance of a polyphase network comprising a plurality of interconnected phase circuits adapted to be connected to the multiple phase rotor windings of the motor, comprising:

a. each of said phase circuits comprising a plurality of parallel connected series networks;

b. each of said series networks comprising resistance means and thyristor means connected to be self-commutated by the phase signals induced in the phase windings of the rotor windings;

c. a source of speed control signal whose magnitude is representative of the desired speed of said wound rotor motor;

d. control means comprising an input coupled to said source, and a plurality of outputs;

e. gating means coupled from each of one of said outputs to gate on the thyristor means in a specified one of said series networks of each phase circuit; and

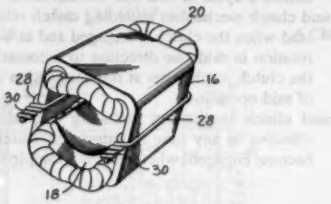
f. said control means being constructed to sequentially produce signals on consecutive ones of said outputs responsive to magnitude changes of said speed control signal representative of calls for increasing motor speed to consecutively gate on the thyristor means of additional ones of said parallel connected networks of each phase circuit so that the resistance means of additional ones of said parallel connected series networks are inserted in parallel in each phase circuit.

4,065,705

SCR CONTROLLED UNIVERSAL MOTOR

William R. Hicks, Spencerport, and Homer R. Miller, Rochester, both of N.Y., assignors to General Electric Company, Bridgeport, Conn.

Filed Mar. 1, 1976, Ser. No. 662,959
Int. Cl.² H02P 7/08
U.S. Cl. 318—245 **10 Claims**



1. In an SCR circuit controlled universal motor, means for providing smooth speed control at all speed settings comprising,

a series wound stator field in said motor, and

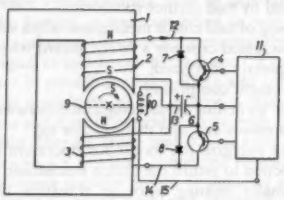
at least one closed conductor loop of wire encircling the stator magnetic flux path.

4,065,706

BRUSHLESS D.C. MOTOR

Alexander Benett Gosling, and Barrie Ewart Mealing, both of Cambridge, England, assignors to Danfoss A/S, Nordborg, Denmark

Filed July 6, 1976, Ser. No. 702,493
Claims priority, application Germany, June 18, 1975, 2527041
Int. Cl.² H02K 29/00
U.S. Cl. 318—254 **6 Claims**



1. A brushless self-starting D.C. motor assembly comprising, a rotor having a permanent magnet providing a premagnetized rotor field, a stator and stator windings, a D.C. source, electrically controllable switch means between said source and said winding, position sensing coil means adjacent said rotor and having a core which is at least partially ferrite and which is saturatable by said rotor field at a predetermined position of said rotor to provide a control signal, switch control means between said coil means and said switch means for receiving said signal and actuating said switch means, and auxilliary magnetic means for establishing a static magnetic field distribution in which said stator is displaced an acute angle from a dead center position relative to said stator.

4,065,707

SAFETY MOTOR CONTROL MEANS FOR AN ELECTRICALLY DRIVEN MACHINE

Phillip R. Becker, 3830 Ironwood Place, Landover, Md. 20785

Filed Dec. 17, 1975, Ser. No. 641,775
Int. Cl.² H02P 1/22
U.S. Cl. 318—285 **10 Claims**

1. In a safety machanism for a machine of the type which comprises:

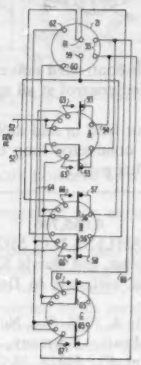
a working mechanism to be operated intermittently by an electric drive motor running continuously in one direction to perform a predetermined cycle of operations;

manual switch means to connect said drive motor to an electrical source;

a mechanical clutch mechanism adapted to be engaged for transmitting motive power from said drive motor while running in said one direction to the working mechanism to initiate a cycle of said operations;

said clutch mechanism including clutch release means actuated when the clutch is engaged and as a result of further rotation in said one direction to automatically disengage the clutch mechanism at the completion of a single cycle of said operations;

said clutch mechanism including manual tripping means effective at any time to cause said clutch mechanism to become engaged, whether or not said drive motor is energized, and to remain engaged until said release means is actuated by said further rotation;



the tripping of said clutch mechanism when said drive motor is deenergized creating a safety hazard when the motor is subsequently energized;

the improvement comprising;

automatic switching means connected between said manual switch means and said drive motor to;

initially energize the motor for operation in the reverse direction to return the clutch mechanism to a condition normally existing prior to actuation of said release means;

subsequently energize the motor for operation in said one direction to actuate said release means, and;

continue energization of the motor for continuous operation in said one direction until deenergized by said manual switch means.

4,065,708

METHOD AND APPARATUS FOR DETERMINING STEPPING MOTOR PARAMETERS FROM INDUCED VOLTAGES

Hartmut Ulland, Sindelfingen; Volker Zimmermann, Schoenaich, and Rainer Zuehlke, Warmbronn, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1975, Ser. No. 620,097

Claims priority, application Germany, Oct. 5, 1974, 2447673

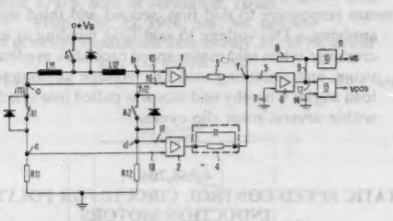
Int. Cl.² H02K *29/02*

U.S. Cl. 318—685 **8 Claims**

1. In combination with an electrical stepping motor having at least two bifilar winding pairs, means for determining speed and position values of said stepping motor comprising:

amplifying means for receiving induced voltages within the said bifilar windings of the said stepping motor in addition to applied voltages across and currents through the said bifilar windings;

rectifier means responsive to said induced voltages for providing an output signal proportional to the instantaneous speed values of the said stepping motor; and



detector means responsive to said induced voltages for providing an output signal indicative of the position of the said stepping motor.

4,065,709

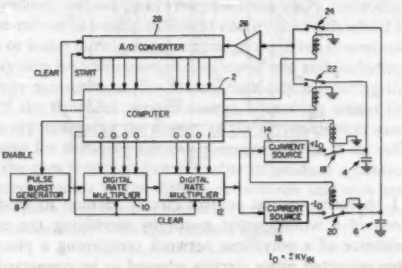
DIGITAL APPARATUS FOR SETTING THE VOLTAGE ACROSS A CAPACITOR

Robert A. Sliwa, Woodcliff Lake, and Edward J. Golden, Hamburg, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Apr. 2, 1976, Ser. No. 673,333

Int. Cl.² F42C *11/04;* **G05F** *1/62;* **H02J** *15/00*

U.S. Cl. 320—1 **6 Claims**



1. Digital apparatus for setting the voltage across capacitor means, comprising:

current source means for applying current pulses to the capacitor means, and initially applying a single current pulse to said capacitor means;

converting means for converting the analog voltage across the capacitor means provided in response to the single current pulse to a corresponding digital output;

computing means responsive to the digital output for computing the capacitance of the capacitor means and for providing a corresponding digital output;

a pulse source for providing a fixed number of pulses;

multiplying means connected to the computing means and to the pulse source for multiplying the fixed number of pulses from the pulse source by the digital output from the computing means and for providing a predetermined number of pulses; and

the current source means connected to the last mentioned means and responsive to the predetermined number of pulses therefrom for applying a corresponding number of current pulses to the capacitor means for setting the voltage across the capacitor means.

4,065,710

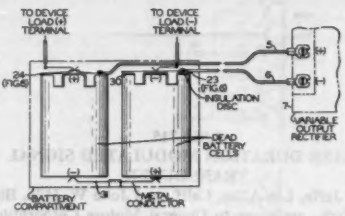
SUBSTITUTE POWER SUPPLY AND BATTERY CHARGER FOR BATTERY OPERATED APPARATUS

Bernard J. Zytka, 1492 Great Oak Drive, Pittsburgh, Pa. 15220

Continuation-in-part of Ser. No. 607,107, Aug. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 538,321, Jan. 3, 1975, abandoned. This application May 24, 1976, Ser. No. 689,581

Int. Cl.[2] H02J 7/00

U.S. Cl. 320—2 11 Claims



1. An external power supply arrangement for battery operated apparatus, comprising in combination,

a. a first and a second contactor element, each formed for contacting a battery terminal when inserted within said battery operated apparatus,

b. a connecting means for coupling said first and second contactor elements to opposite polarity terminals of an external direct current source, and

c. an insulating means formed for inserting within said battery operated apparatus adjacent one of said first and second contactor elements,

d. energy being supplied by said source to operate said apparatus or to charge the operating batteries within said apparatus as said insulating means is selectively placed adjacent a first or a second surface, respectively, of said one contactor element.

4,065,711

CHOPPER ASSISTED UNINTERRUPTIBLE POWER SUPPLY

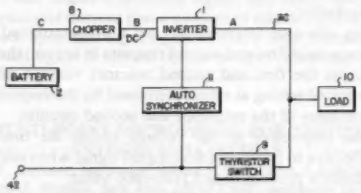
Takao Kawabata, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 21, 1976, Ser. No. 725,052

Claims priority, application Japan, Sept. 22, 1975, 50-114589

Int. Cl.[2] H02J 7/04

U.S. Cl. 320—14 8 Claims



1. In an uninterruptible power supply (UPS) for supplying AC power to a load from an AC power supply and for supplying energy to a standby battery with energy converted through an inverter from the AC power supply in anticipation of a failure in the AC power supply, the combination of:

bilateral chopper means connected between said inverter and said battery for providing energy conversion in both directions between said battery and said inverter.

4,065,712

RAPID CHARGING SYSTEM AND METHOD FOR SEALED STORAGE CELLS

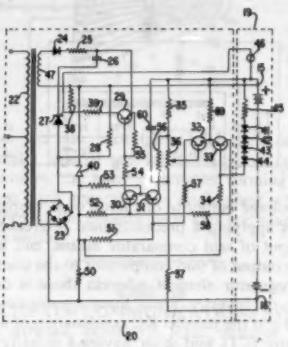
Pierre Godard, Livry-Gargan, and Robert Henri Lapuyade, Andilly, both of France, assignors to Societe des Accumulateurs Fixes et de Traction, France

Continuation of Ser. No. 193,301, Oct. 28, 1971, abandoned. This application Feb. 1, 1974, Ser. No. 438,654

Claims priority, application France, Oct. 30, 1970, 70.39139; Dec. 21, 1970, 70.46044

Int. Cl.[2] H02J 7/04

U.S. Cl. 320—39 6 Claims



1. A d.c. charger for a sealed storage battery comprising a rapid charging circuit connected to terminals of said battery, a circuit breaker in said circuit, and a circuit for triggering said circuit breaker to effect cut-off condition of said circuit breaker and interruption of rapid charging of said battery, said last-named circuit including comparison means for permanently comparing the voltage across said battery terminals with a reference voltage during flow of said rapid charging current to the battery, means connected to said comparison means and to said circuit breaker for permanently supplying a continuous signal to said circuit breaker and for operating said circuit breaker to cut-off condition when said continuous signal changes its magnitude, an a.c. source, a transformer connected thereto and a rectifier bridge to provide d.c. charging current in said charger from said a.c. source, said circuit breaker comprising a thyristor connected to said a.c. source through a half-wave rectifier bridge, an inductor and a current regulating circuit in series with said thyristor and a diode connected in parallel with the rectifier bridge and the thyristor.

4,065,713

VOLTAGE STABILIZER

Werner Pollmeier, Verl, Germany, assignor to Nixdorf Computer AG, Germany

Filed Sept. 11, 1975, Ser. No. 612,498

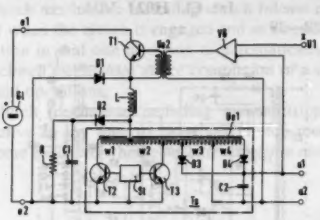
Claims priority, application Germany, Sept. 13, 1974, 2443893; July 17, 1975, 2532019

Int. Cl.[2] H02M 3/335

U.S. Cl. 363—19 8 Claims

1. A voltage stabilizer circuit arrangement comprising input terminals for the receipt of an unstabilized input direct voltage, a series combination including a series regulator element having a control input and an energy storage means including an inductance connected directly to the controlled path of the series regulator element, with said series regulator element connected to one said input terminal and said energy storage means connected to the other said input terminal, and the end of the inductance connected to the series regulator element also connected with the said other input terminal by way of a diode poled so as to be energized in the forward direction by

the inductive turn-off voltage appearing on the inductance, and a control circuit arranged to control the series regulator element in accordance with the difference between a predetermined reference voltage and the stabilized voltage,, characterized by an inverter circuit (Ts) having a direct current input and an alternating current output, with said direct current input being connected between the inductor (L) of the energy storage circuit and said other input terminal (e2), and said inverter circuit output connected by way of a rectifier circuit (D3, D4) to provide a direct voltage output, means applying



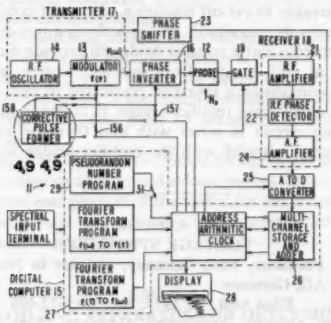
said direct voltage output to one input of a comparator means (VG), means applying a predetermined reference voltage to the other input of said comparator means, and means (Ue2) applying the output of said comparator to the control input of said series regulator element wherein there is connected in parallel with the inverter circuit input a series combination of a diode (D2) and the parallel RC combination of a resistor (R) and a capacitor (C1), said diode having a polarity such that it is energized in the forward direction by the inductive turn-off voltages appearing on the inductance.

4,065,714

PULSED RF EXCITED SPECTROMETER HAVING IMPROVED PULSE WIDTH CONTROL

Howard D. W. Hill, Cupertino, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed June 21, 1976, Ser. No. 698,245
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—.5 A **13 Claims**



1. In a method of exciting and detecting resonance of a sample of matter under investigation in a radio frequency spectrometer, the steps of:

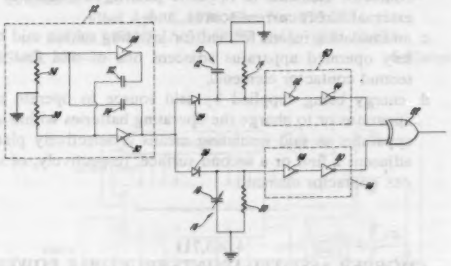
generating and applying an excitation pulse train of radio frequency energy to the said sample of matter to excite resonance thereof, said pulse train including a train of composite pulses, each composite pulse being shaped to cause the nuclei of said sample to respond as if the composite pulse had substantially zero rise and fall times, each said composite pulse having a primary pulse component of radio frequency energy of a first phase, and an associated secondary pulse component of radio frequency energy of a second phase opposite to that of said first phase, said secondary pulse component being shorter than said primary pulse component, and further, said secondary and primary pulse components having substantially identical rise and fall characteristics whereby the excited nuclei of said sample combine the effects of the first and second phases of said composite pulse excitation so that the detectable nuclei free procession following said composite pulse substantially corresponds to the free precession response of the sample nuclei to a theoretical excitation pulse having a zero rise and fall time.

4,065,715

PULSE DURATION MODULATED SIGNAL TRANSDUCER

James M. Jaffe, Los Altos, Calif., and John W. Hile, Birmingham, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 642,057, Dec. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 535,175, Dec. 23, 1974, abandoned. This application July 2, 1976, Ser. No. 702,110
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—60 CD **7 Claims**



6. A transducer effective to produce a pulse duration modulated signal in accord with the value of the parameter, comprising in combination:

a reference circuit having a first reactor and a first resistor defining a predetermined time constant;

a second circuit having a second reactor and a second resistor, at least one of which varies in accordance with the parameter to define a time constant determined by the parameter;

means effective to repeatedly set a predetermined voltage across said first and second reactors in unison, the voltage across the first and second reactors varying after each repeated setting at rates determined by the respective time constants of the reference and second circuits;

means responsive to the voltage across the first reactor effective to produce a first digital signal when said voltage attains a predetermined reference value;

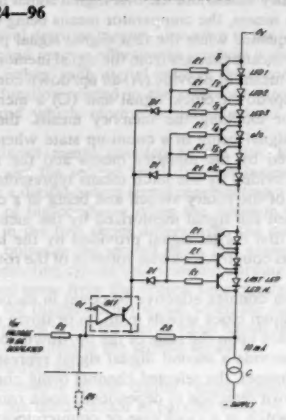
means responsive to the voltage across the second reactor effective to produce a second digital signal when said voltage attains the predetermined reference value; and

a logic circuit responsive to the first and second digital signals effective to generate a series of pulses, each pulse commencing upon the termination of the shortest one of the first or second digital signals and terminating upon the termination of the longest one of the first or second digital signals, each pulse having a duration determined by the value of said parameter.

4,065,716
APPARATUS FOR DISPLAYING A BAND REPRESENTATION OF A SIGNAL

Rory Morgan O'Brien, Hitchin, England, assignor to Alfred Herbert Limited, Coventry, England

Filed Feb. 25, 1977, Ser. No. 772,273
Claims priority, application United Kingdom, Feb. 27, 1976, 7910/76
Int. Cl.[2] G01R *31/00*
U.S. Cl. 324—96 14 Claims



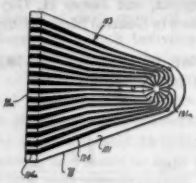
1. Band representation display apparatus comprising:
a plurality of electrical light-emission devices which are physically positioned for forming a band representation and which are electrically connected in series with one another,
electrical current supply means which is connected to one end of the series of light-emission devices and which is operable for making electrical current available to flow through the series to light the devices,
control means including a plurality of switch means, which switch means are connected across respective associated ones of said devices and which are each operable for bypassing said continuous electrical current past the associated device,
a conductive portion for receiving an input signal of which a band representation is to be displayed, and
feedback means which is connected to said series arrangement and which is operable for delivering a negative feedback signal representative of the sum of the potential difference(s) across the lit light-emission device(s),
said control means being connected to said conductive portion and said feedback means to receive said input signal and said negative feedback signal, and being operable to bypass said current past a number of said devices in dependence upon said input signal so that a band representation of said signal is formed by the devices remaining lit.

4,065,717
MULTI-POINT MICROPROBE FOR TESTING INTEGRATED CIRCUITS

Lionel E. Kattner, Saratoga; Albert P. Youmans, Cupertino, and Patrick J. Shasby, San Jose, all of Calif., assignors to Signetics Corporation, Synnyvale, Calif.

Continuation of Ser. No. 72,521, Sept. 15, 1970, which is a continuation of Ser. No. 733,718, May 31, 1968, abandoned, which is a division of Ser. No. 336,489, Jan. 8, 1964, Pat. No. 3,405,361. This application July 19, 1973, Ser. No. 380,859
Int. Cl.[2] G01R *1/06, 31/26*
U.S. Cl. 324—158 P 14 Claims

5. In a multiple contact lead structure for use with a semiconductor device having a substantially planar surface with a plurality of closely spaced contact pads on said surface forming a pattern adjacent the outer perimeter of the same, the multiple contact lead structure comprising a flexible sheet-like member of insulating material having one portion thereof forming a substantially planar surface and a plurality of spaced leads of thin metallic film adjacent to said surface of said sheet-like member so that they are insulated from each other and

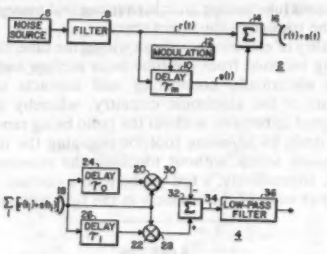


having inner and outer extremities with the inner extremities being generally tapered and substantially narrower than the outer extremities, the inner extremities forming a pattern of contact areas lying generally in a single plane which conform to the pattern of the contact pads and are adapted to make contact therewith.

4,065,718
MULTIPATH COMMUNICATIONS SYSTEM

Stanley W. Attwood, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 30, 1976, Ser. No. 756,046
Int. Cl.[2] H03C *3/08*
U.S. Cl. 325—65 2 Claims



1. A system for transmission of communications signals comprising in combination:
a transmitter, said transmitter further comprising:
means for generating a reference noise signal having a predetermined bandwidth and having a predetermined center frequency;
means for delaying said reference noise signal, said delaying means being responsive to the communication signals to provide a plurality of delays ranging from a predetermined minimum to a predetermined maximum delay time;
means for summing said reference noise signal and said delayed reference noise signal; and
means for radiating said summed reference noise and delayed reference noise signals; and
a receiver, said receiver further comprising:
means for receiving said radiated summed signals;
means for time delaying said received summed signals, said time delay means providing at least one fixed time delay corresponding to one of said predetermined time delays in said transmitter;
at least one means for multiplying said summed signals by said delayed summed signals to provide product signals;
means for differencing said product signals to recover the communication signals; and

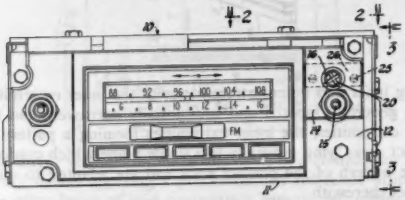
means for algebraically integrating the recovered communication signals.

4,065,719

DIAGNOSTIC CONNECTION MEANS FOR VEHICLE MOUNTED RADIO

Herbert M. Penningroth, and James H. Guyton, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1976, Ser. No. 742,051
Int. Cl.² H04B *17/00*
U.S. Cl. 325—312 **2 Claims**



2. In a radio adapted for mounting in a motor vehicle dash, the radio having a case enclosing electronic circuitry including antenna trimmer means having an antenna trimmer adjustment screw, the case having a front plate with an opening providing access to the antenna trimmer adjustment screw for an adjusting tool from the front of the radio, the improvement comprising:

an electrically non-conducting tube extending from the trimmer adjustment screw through the front plate opening, said tube having an inner surface and providing access to the trimmer adjustment screw;

a plurality of electrical contacts within the tube, the contacts being recessed from the tube inner surface and

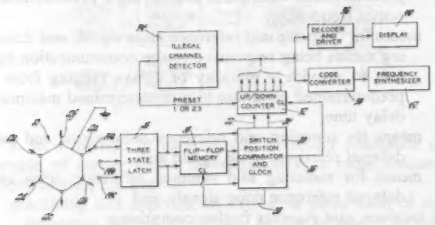
means electrically connecting said contacts to selected points of the electronic circuitry, whereby the tube is adapted to receive, without the radio being removed from the dash, an adjusting tool for engaging the trimmer adjustment screw without touching the recessed contacts and, alternatively, a test probe with a contact adapted to engage each of the contacts in the tube selectively.

4,065,720

ELECTRONIC CHANNEL SELECTOR

Russell W. Pogue, Jr., Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 18, 1977, Ser. No. 779,017
Int. Cl.² H03K *21/36*
U.S. Cl. 325—464 **3 Claims**



1. An electronic channel selector for providing a signal representing a selected channel, the selector comprising:

a rotary switch having the number N discrete angular positions, N/3 movable angularly spaced contacts, and three stationary contacts angularly spaced so as to be sequentially engaged in a first order by the movable contacts as the rotary switch is rotated to sequential angular positions in a clockwise direction and in a second order opposite to the first order when the rotary switch is rotated to sequential angular positions in a counterclockwise direction;

a latch means coupled to the stationary contacts effective to provide a first digital signal identifying the last stationary contact engaged by one of the movable contacts;

a memory means effective when clocked, to memorize the first digital signal provided by the latch means;

a comparator means responsive to the signal memorized by the memory means and the first digital signal provided by the latch means, the comparator means being effective in timed sequence when the first digital signal provided by the latch means changes from the signal memorized by the memory means to provide (A) an up/down control signal, (B) an up/down clock signal and (C) a memory clock signal for clocking the memory means, the up/down control signal being in a count-up state when the signal memorized by the memory means and the first digital signal provided by the latch means represents clockwise rotation of the rotary switch and being in a count-down state when the signal memorized by the memory means and the first digital signal provided by the latch means represents counterclockwise rotation of the rotary switch; and

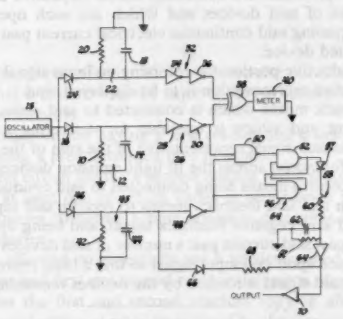
an up/down counter effective to count in successive steps the up/down clock signals in an up or down direction in dependence upon the state of the up/down control signal and to provide a second digital signal representing a selected channel, the selected channel being changed in an up or down direction in dependence upon rotation of the rotary switch in a clockwise or counterclockwise direction.

4,065,721

SOLID STATE THRESHOLD DETECTOR WITH HYSTERESIS

Paul R. Rabe, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1976, Ser. No. 741,729
Int. Cl.² H03K *5/20, 7/08, 7/10*
U.S. Cl. 328—1 **3 Claims**



1. A threshold detector circuit having a setpoint with hysteresis for providing an output representing the critical magnitude of a condition, the circuit comprising:

a monitoring circuit having a first reactance element and a first resistor, at least one of which varies in accordance with the magnitude of the condition to define a monitoring circuit time constant determined by the magnitude of the condition, the monitoring circuit time constant varying in a predetermined sense from a critical time constant when the magnitude of the condition is critical;

a reference circuit having a second reactance element and a second resistor defining a first reference circuit time constant equal to the critical time constant;

means effective to repeatedly set a predetermined voltage

across the first and second reactance elements in unison, the voltage across the first and second reactance elements varying after each repeated setting at rates determined by the respective time constants of the monitoring and reference circuits;

first level detector means responsive to the voltage across the first reactance element effective to produce a first series of digital pulses, each digital pulse in the first series having a duration related to the monitoring circuit time constant;

second level detector means responsive to the voltage across the second reactor effective to produce a second series of digital pulses, each digital pulse in the second series having a duration related to the reference circuit time constant and which represents the threshold detector setpoint;

output circuit means coupled to the first level detector means and the second level detector means effective to initiate a digital output signal representing a critical magnitude of the condition when the duration of the digital pulses in the first series differs from the duration of the digital pulses in the second series in a sense representing the monitoring circuit time constant varying in the predetermined sense from the critical time constant and terminating the digital output signal when the duration of the digital pulses in the first series again equals the duration of the digital pulses in the second series;

a third resistor; and

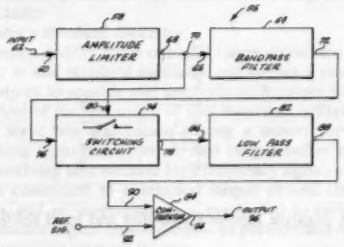
means responsive to the digital output signal effective to couple the third resistor in parallel with the second resistor for the duration of the digital output signal, the second reactance element and the second and third resistors defining a second reference circuit time constant during the period of the digital output signal that is different from the critical time constant in a sense opposite the predetermined sense, the duration of the digital pulses in the second series being varied upon the provision of the digital output signal so as to provide for hysteresis in the threshold detector setpoint.

4,065,722

DEMODULATION METHOD AND CIRCUIT FOR DISCRETELY MODULATED AC SIGNALS

John R. Francis, Port Moody, Canada, assignor to Glenayre Electronics, Ltd., North Vancouver, Canada

Filed Dec. 27, 1976, Ser. No. 753,993
Int. Cl.² H03D *1/00, 3/00, 5/00*
U.S. Cl. 329—105 **18 Claims**



1. A demodulator circuit for recovering an information signal from a modulated ac signal which has been modulated by discrete changes in one of the following: amplitude, frequency, and phase, and which during at least certain intervals has a predetermined frequency and a non-zero amplitude, comprising:

a bandpass filter means having an input for receiving said modulated ac signal and having an output, said bandpass filter means selectively passing to said output those components of signals received at said input that have frequencies which fall within a predetermined bandpass centered about said predetermined frequency;

switching circuit means having a signal input, a signal output and a control input, said signal input being connected to said output of said bandpass filter means, and said control input being connected to said input of said bandpass filter means, said switching circuit means being responsive to signals appearing at said input of said bandpass filter means to alternately switch between a first state and a second state at a frequency and phase so related to those components of said modulated ac signal passed to said output of said bandpass filter means so that when said modulated ac signal has said predetermined frequency and said non-zero amplitude said switching circuit means is switched between said states so as to cause, between said signal input and said signal output, a rectification-like detection of those components of said modulated ac signal passed to said output of said bandpass filter means; and

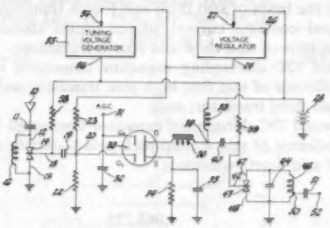
a low-pass filter means connected to said signal output of said switching circuit means for filtering from the detected components of said modulated ac signal those signal frequencies at and above said predetermined frequency so as to pass only signals that represent said discrete changes in said modulated ac signal, and thus represent said information signal.

4,065,723

TUNED RADIO FREQUENCY AMPLIFIER WITH BACK TO BACK VARACTOR DIODES CONNECTED THROUGH A COMMON CATHODE LEAD

Thomas E. Endres, and Donald W. Rodeman, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1976, Ser. No. 714,485
Int. Cl.² H03F *3/04*
U.S. Cl. 330—302 **2 Claims**



1. A tuned radio frequency amplifier for use with a signal receiving antenna, the tuner comprising, in combination:

signal amplification means having an input adapted for connection to the antenna to receive and amplify the signal therefrom and further having an output;

a pair of varactor diodes, each having a cathode and an anode, the cathodes of the varactor diodes being connected together in a common connection;

means for providng a variable regulated tuning voltage to the common connection of the varactor diode cathodes;

an inductor connected between the anodes of the varactor diode, the inductor comprising an output for the amplifier; and

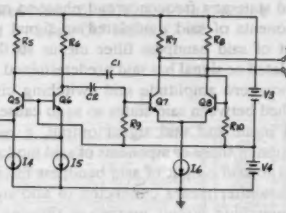
means connecting the output of the signal amplification means to the common connection of the varactor diode cathodes, whereby the varactor diodes and inductor form a tuned circuit for the signal amplification means with an input through the common connection, in which a smaller range of tuning voltage is required for a given range of tuned frequencies than would be required if input were through one of the anodes.

4,065,724

BALANCED LOW IMPEDANCE DIFFERENTIAL INPUT LINE PREAMPLIFIER

Joseph B. Wicklund, Jr., Bothell, Wash., assignor to Opcon, Inc., Everett, Wash.

Division of Ser. No. 608,664, Aug. 28, 1975, Pat. No. 4,015,117.
This application Aug. 2, 1976, Ser. No. 710,626
Int. Cl.[2] H03F *3/45*
U.S. Cl. 330—252 **4 Claims**



1. A balanced low impedance differential input line preamplifier having low input impedance and good common mode rejection comprising:

a first common base input stage including a first high gain transistor having its emitter connected to directly receive a first input signal applied to said balanced low impedance differential input line preamplifier;

a second common base stage including a second high gain transistor having its emitter connected to directly receive a second input signal applied to said balanced low impedance differential input line preamplifier, the base of said second high gain transistor connected to the base of said first high gain transistor;

first constant current source means connected to the emitters of said first and second high gain transistors;

a differential amplifier including third and fourth transistors connected together such that they produce an output signal related to the difference in the input signal applied to the bases of said third and fourth transistors;

second constant current source means connected to the emitters of said third and fourth transistors;

a first DC decoupling capacitor connected between the collector of said first high gain transistor and the base of said third transistor; and,

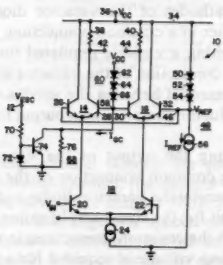
a second DC decoupling capacitor connected between the collector of said second high gain transistor and the base of said fourth transistor.

4,065,725

GAIN CONTROL CIRCUIT

William Joseph Lillis, Tempe, and Paul Mike Henry, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 16, 1976, Ser. No. 714,727
Int. Cl.[2] H03F *3/45*; H03G *3/30*
U.S. Cl. 330—254 **19 Claims**



1. A gain controlled amplifier including a differential input stage responsive to an input signal for deriving a differential output signal at first and second outputs, first and second differential output stages each having a first input interconnected to a first node, and each having a second input interconnected to a second node, the common terminal of each of the output stages being coupled to a respective output of the input differential stage, the improvement comprising:

a reference circuit means coupled to the first node including at least one electron control means for providing a reference voltage at the first node having a predetermined temperature characteristic; and

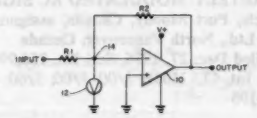
gain control means coupled to the second node which is responsive to an applied gain control signal for causing the gain of the amplifier to vary in accordance with said applied gain control signal, said gain control means including at least one electron control means for causing the voltage appearing at the second node to have a substantially identical temperature characteristic as said reference voltage and to be varied in a linear fashion such that the gain of the amplifier is varied linearly in accordance with said applied gain control signal and the gain control characteristic is independent to variations in ambient temperature and power supply voltages.

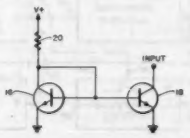
4,065,726

NEGATIVE FEEDBACK AMPLIFIER AND LEVER SHIFTER

Stephen J. Senger, Jamestown, N. Dak., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 11, 1976, Ser. No. 713,455
Int. Cl.[2] H03F *3/04*
U.S. Cl. 330—288 **5 Claims**





1. A negative feedback amplifier and level shifter comprising:

a. a DC amplifier having an output, a negative input and a positive input;

b. a feedback resistance connected between said output and said negative input at said DC amplifier;

c. an input resistance connected between a signal input and said negative input of said DC amplifier to form a summing junction at said negative input of said DC amplifier;

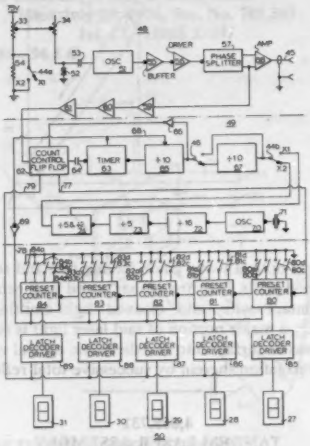
d. a matched pair of transistors configured to form a current source connected to draw a predetermined amount of current from said summing junction thereby controlling DC voltage levels at said output of said DC amplifier independently of AC gain of said DC amplifier.

4,065,727

VARIABLE FREQUENCY OSCILLATOR HAVING PROGRAMMABLE DIGITAL FREQUENCY DISPLAY

William Glen Johnson, Sr., 1251 Hiawatha St., Stockton, Calif. 95205

Filed Oct. 1, 1976, Ser. No. 728,518
Int. Cl.[2] H03B 19/12
U.S. Cl. 331—51 10 Claims



1. A self-contained high frequency range variable frequency oscillator system for connection to a user's high frequency radio set regardless of its design and capable of functioning in lieu of a local oscillator in said set, said system comprising:

high frequency oscillator means for generating a radio signal at a primary frequency variable within a range in the high frequency spectrum;

frequency variation means connected to said high frequency oscillator means for enabling the user to vary the primary frequency thereof;

output buffer means connected to said oscillator means and to said radio set for isolating said oscillator means from said radio set;

time base generator means for generating a control signal providing a predetermined recurrent counting interval wherein said time base generator means provides a plurality of different predetermined recurrent counting intervals and includes

a frequency standard oscillator;

a frequency divider chain of plural stages connected at its input to said standard oscillator and having a plurality of outputs to provide said intervals, each output being a quotient of the frequency of said standard oscillator;

master slave flip flop means having a master flip flop clocking input connected to said output buffer means for receiving said variable high frequency signal, a reset input connected to a selected output of said divider chain, and an inverting output connected to said programmable digital counter means to provide said recurrent counting interval thereto;

said master slave flip flop means having a slave flip flop clocking input connected to said reset input of said master flip flop, a reset input connected to one of said plural stages of said frequency divider chain, a non-inverting output connected to a resistance-capicitance timing circuit, and an inverting output connected to said digital display means for latching the total count reached by said digital counter during a display interval;

monostable multivibrator means having an input connected to said resistance-capacitance timing circuit and an output connected to said frequency divider chain to disable said output quotient during said display interval and to said programmable digital counter means for resetting said counter at the beginning of said display interval; and

count range selector switch means connected to said time base generator means for selecting between said different intervals;

presettable digital counter means connected to said output buffer means and to said time base generator means for recounting the number of oscillations of said radio signal occurring during each said counting interval, and having an output;

manual set switch means connected to said digital counter means for enabling the user to preset a fixed count into said digital counter means, said fixed count being a function of the difference between the frequency at which said set is operating and the frequency of said radio signal;

digital display means connected to said time base generator means and to the output of said digital counter means for displayin the frequency to which said radio set is tuned,

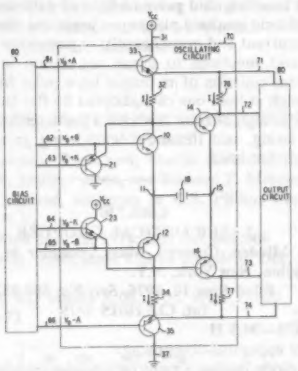
whereby the user may connect said system to an unlimited variety of high frequency radio sets having vastly different offsets between local oscillator frequency and operating frequency and still obtain a display of virtual operating frequency of the set by presetting said digital counter means with the fixed count appropriate to the particular set to which said system is connected.

4,065,728

CRYSTAL OSCILLATOR INCLUDING A PAIR OF PUSH-PULL COMPLEMENTARY TRANSISTOR AMPLIFIERS

Veikko Reynold Saari, Spring Lake Heights, N.J., Assignor to Bell Telephone Laboratories Murray Hill, N.J.

Filed Dec. 13, 1976, Ser. No. 749,785
Int. Cl.[2] H03B 5/36
U.S. Cl. 331—75 20 Claims



1. An oscillator comprising

a first push-pull non-inverting amplifier stage including a first pair of serially-connected complementary transistors,

a second push-pull non-inverting amplifier stage connected to said first stage and including a second pair of serially-connected complementary transistors,

resonant feedback path means connected between said first and second amplifier stages,

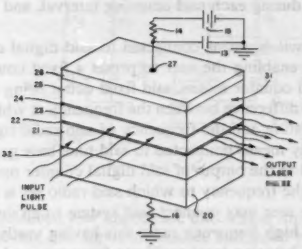
and means connected to at least one of said amplifier stages for controlling the oscillation amplitude of said oscillator.

4,065,729

MONOLITHIC PNPN INJECTION LASER OPTICAL REPEATER

Avraham Gover; Ilan Samid, and Chien-Ping Lee, all of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Apr. 16, 1976, Ser. No. 677,529
Int. Cl.[2] H01S 3/19
U.S. Cl. 331—94.5 H **11 Claims**



1. An optical repeater comprising a monolithic PNPN injection laser for detecting an incident pulse of light of predetermined minimum amplitude and retransmitting a high amplitude laser pulse, said laser being comprised of a crystal of direct band-gap semiconductor material in at least four layers of N-type and P-type material to provide at least two planar p-n junctions of the same polarity separated by a planar p-n junction of opposite polarity, said junctions cooperating to form a structure having active regions where charged carriers recombine, said structure exhibiting a negative resistance V-I characteristic having a breakover voltage at which high conduction occurs, said high conduction being maintained so long as a minimum holding current level is maintained through said structure, said crystal having a pair of optically flat and parallel faces normal to said planar junctions, means for biasing said structure across said junctions in series at a voltage below said breakover voltage, means coupled to said biasing means for storing a predetermined quantity of charge to be discharged through said structure when switched to high conduction, and means for coupling said pulse of light of predetermined minimum amplitude into said planar p-n junctions thereby producing photocurrent and consequently regenerative high current through said junctions to cause population inversion with simultaneous emission of an output laser pulse from said junctions through at least one of said optically flat faces while said regenerative high current is above a predetermined threshold level for lasing, said threshold level being greater than said holding current level.

4,065,730

LASER OPTICAL COUPLER

Henry T. Minden, Concord, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 10, 1976, Ser. No. 694,852
Int. Cl.[2] H01S 3/19
U.S. Cl. 331—94.5 H **8 Claims**

1. Laser apparatus comprising:

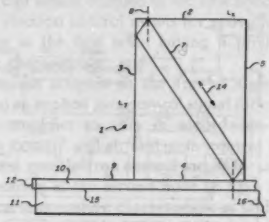
a laser diode having a right rectangular parallelipiped semiconductor body, said body having a layer wherein laser light is generated disposed between first and second opposed major rectangular surfaces of said body,

said body having a cleaved light-emitting surface disposed at right angles to said opposed major rectangular surfaces,

first and second electrical contacts disposed respectively directly on said opposed major rectangular surfaces of said semiconductor body,

said first contact being so disposed on said first opposed major rectangular surface as to inhibit light generation except in a parallelogram located at the diagonal of said right rectangular parallelipiped semiconductor body within the light generating layer, only one corner of said parallelogram contacting said cleaved light-emitting surface,

said parallelogram having a length substantially equal to said diagonal and a width substantially smaller than said length, and



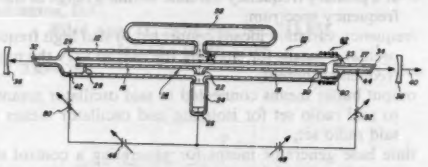
a dielectric optical wave guide having first and second planar broad walls, said first planar broad wall being in optical contact with said cleaved light-emitting surface whereby a major portion of said laser light is refracted at said cleaved surface into said dielectric optical wave guide for propagation therein by successive total reflections.

4,065,731

TANDEM LASER ASSEMBLY

Shing Chung Wang, Temple City, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1976, Ser. No. 680,563
Int. Cl.[2] H01S 3/22
U.S. Cl. 331—94.5 G **13 Claims**



1. A laser discharge tube for producing an output laser beam having a plurality of wavelengths comprising:

a unitary positive column laser comprising first and second capillary discharge sectiions, said sections containing respectively a first and second active laser medium,

a tube envelope for enclosing said first and second active lasing media,

a discharge tube having first and second end portions supported within said tube envelope forming a resonant laser cavity, said discharge tube having an opening located between said first and second end portions,

a first electrode positioned adjacent said first discharge tube end,

a second electrode positioned adajcent said discharge tube opening,

a third electrode positioned adjacent said second tube, and

means for applying an electrostatic potential between said first, second and third electrodes of a polarity to maintain a first discharge between said first electrode and said second electrode through (a) said first portion of said discharge tube whereby said first active lasing medium produces a first laser beam of a single wavelength and to maintain a second discharge between the third and second said electrodes through said second portion of said discharge tube whereby said second active lasing medium produces a second laser beam comprising at least one wavelength, said first and second laser beams being com-

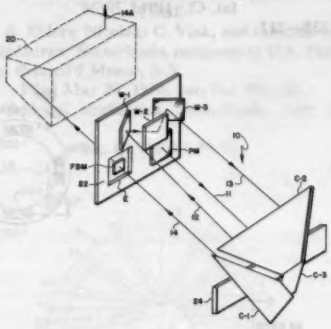
bined into a laser output beam having a plurality of wavelengths.

4,065,732

ENERGY RESONATING SYSTEM WITH ELIMINATION OF OPTICAL BENCH STRUCTURE

Frank H. Scammell, Concord, Mass., assignor to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed July 29, 1976, Ser. No. 709,843
Int. Cl.² H01S 3/081
U.S. Cl. 331—94.5 C 9 Claims



1. Energy resonating system comprising:

means defining at least one cavity space with primary and feedback mirrors,

means defining a pair of additional opposing mirror assemblies bracketing the cavity space, said primary and feedback mirrors and said mirror assemblies defining an optically resonant cavity,

means for energizing the cavity space, and

mounting means for said mirror assemblies constructed and arranged to allow relative freedom of movement therebetween,

one of said mirror assemblies being a W-fold mirror assembly and the other a corner cube mirror assembly producing a folded confocal optical reflecting path between the primary and feedback mirrors and including the component mirrors of said W-fold and corner cube assemblies so that occasional relative displacement from an initial alignment between said opposing mirror assemblies is at least substantially compensated notwithstanding relative movement therebetween.

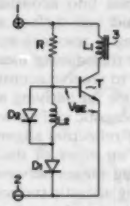
4,065,733

TRANSISTOR BLOCKING OSCILLATOR STABILIZED AGAINST CHANGES IN BIAS VOLTAGE AND TEMPERATURE

Youjiro Shigemori, and Yoshio Mitumori, both of Shizuoka, Japan, assignors to Star Seimitsu Kabushika Kaisha, Japan

Filed Feb. 17, 1977, Ser. No. 769,685
Int. Cl.² H03K 3/30
U.S. Cl. 331—112 2 Claims

1. A blocking oscillator comprising a pair of terminals for connection with a d.c. supply, a transistor having a base, emitter and collector, a resistor connected to supply a base bias to the transistor, a core of high magnetic permeability, a drive coil and a control coil disposed on the core so as to be inductively coupled with each other, the drive coil and the collector-emitter path of the transistor forming a series circuit which is connected across the pair of terminals, another series circuit including the resistor and the control coil being connected across the pair of terminals, the base of the transistor being connected with the junction between the resistor and the control coil, a first, forwardly poled diode connected in series between the control circuit and one of the terminals, and a second, forwardly poled diode connected in shunt with the



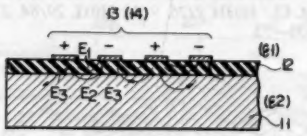
control coil, the transistor and the first and the second diodes being formed of a semiconductor material of a same kind.

4,065,734

ELASTIC SURFACE WAVE DEVICES

Shouzo Takeno; Masao Mashita, both of Yokohama, and Toshihiro Onodera, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed July 14, 1976, Ser. No. 705,177
Claims priority, application Japan, July 14, 1975, 50-85354; July 29, 1975, 50-91581; Nov. 21, 1975, 50-139205
Int. Cl.² H03H 9/04, 9/26, 9/30; H01L 41/18
U.S. Cl. 333—30 R 7 Claims



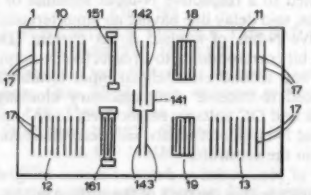
6. An elastic surface wave device comprising a ceramic piezoelectric substrate, a titanium dioxide dielectric film deposited on said piezoelectric substrate, and an interdigital type input-output tranducer formed on said titanium dioxide dielectric film for converting an elastic surface wave energy, said titanium dioxide dielectric film having a thickness of 0.00016 λ to 0.047 λ, where λ represents the wavelength of the elastic surface wave without the dielectric film.

4,065,735

ELECTRICAL FILTERS INCLUDING COUPLED RESONATORS

John S. Palfreeman, Brockham; Martin Redwood, Sevenoaks; Frederick W. Smith, Sutton, and Richard F. Mitchell, Kingston, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,308
Claims priority, application United Kingdom, Dec. 10, 1975, 1724/75
Int. Cl.² H03H 9/04, 9/26, 9/32, 13/00
U.S. Cl. 333—72 13 Claims



1. A surface acoustic wave electrical filter comprising a body of piezoelectric material on one surface of which is ar-

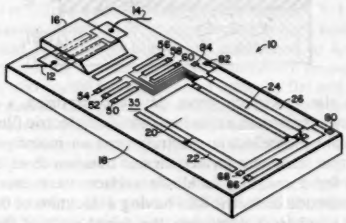
ranged a plurality of coupled acoustic surface wave resonators each having substantially the same centre frequency, input transducing means coupled to said one surface for converting an input electric signal into acoustic surface wave energy propagating along said one surface and into a first of said resonators for exciting a resonant acoustic surface standing wave therein, output transducing means coupled to said one surface and arranged to receive acoustic surface wave energy from a second resonator for deriving an output signal, each of said first and second acoustic surface wave resonators comprising two spaced apart reflectors aligned in tandem with each reflector comprising an array of discrete parallel reflecting elements, and coupling means between said first and second resonators for coupling acoustic surface wave energy from one resonator to the next one, said coupling means comprising first and second arrays of discrete parallel conductive strips on said one surface and electrically insulated from each other, the first and second arrays being individually located in the first and second resonators respectively and being arranged to transfer electrical energy from the first to the second array, whereby part of the acoustic surface wave energy across the first array is transferred to be relaunched as acoustic surface wave energy by the second array.

4,065,736

AMPLITUDE AND PHASE PROGRAMMABLE ACOUSTIC SURFACE WAVE MATCHED FILTER

Arnold London, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 27, 1976, Ser. No. 690,490
Int. Cl.[2] H03H *9/26, 9/30;* **H01L** *29/84, 27/10*
U.S. Cl. 333—72 **9 Claims**



1. An N tapped monolithic circuit acoustic wave filter having amplitude and phase programmability at each tapped output, including a transducer disposed on a surface of a semiconductor substrate for exciting traveling surface waves in response to applied electrical input signals, comprising in combination:

coding means having a first set of input terminals and being responsive to applied signals for deriving N-pair of predetermined bias coding signals said coding means also including a second set of N-input terminals;

a bucket brigade delay line for deriving N-output amplitude weighted signals at N-output terminals to cause the amplitudes of respective ones of said N-pair of coding signals to be varied accordingly, said N-output terminals being coupled to a respective N-input terminal of said coding means, said delay line having an input terminal adapted to receive N-bits of applied direct current (DC) voltages each bit corresponding to a respective N-output signal and first and second clock signal input terminals which are adapted to receive complementary clocking signals to clock said DC voltages respectively to an appropriate one of said N-output terminals, said delay line being integrated within the substrate;

N-pair of piezoresistive detector means integrated into the substrate within the path of the surface waves, each one of said pair of detector means being responsive to respective ones of said N-pair of amplitude varied coding signals for producing N output signals in timed sequence to the surface wave, each output signal having a predetermined phase and amplitude; and

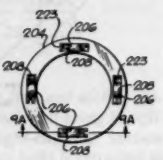
summing means coupled to each output of said N-pair of detector means.

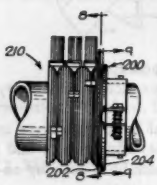
4,065,737

STATIC CONVERGENCE DEVICES FOR COLOR TELEVISION PICTURE TUBES

Albert M. Anthony, Bangor, Mich., assignor to Tracor, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 732,101, Oct. 13, 1976, Pat. No. 4,050,042. This application Oct. 22, 1976, Ser. No. 735,044
Int. Cl.[2] H01J *29/68*
U.S. Cl. 335—212 **22 Claims**





1. A convergence device for television picture tubes,

comprising a mounting sleeve having an axial opening for receiving the neck of a television picture tube,

three beam adjusting assemblies supported on said mounting sleeve,

each of said beam adjusting assemblies including a supporting ring member projecting outwardly from said mounting sleeve,

a pair of magnet rings rotatably mounted around said mounting sleeve and stacked with said supporting ring member,

said magnet rings having respective bevel gears formed in one piece with said magnet rings and facing toward each other,

a rotatable generally radial adjusting shaft having a bevel pinion meshing with and disposed between said bevel gears on said magnet rings,

and shaft supporting means on said supporting ring member and supporting said shaft for rotation about a generally radial axis relative to the axis of the mounting sleeve,

said shaft being rotatable to cause rotation of said magnet rings in opposite directions about the axis of said mounting sleeve,

each of said magnet rings being formed with a plurality of magnetic poles,

at least two of said beam adjusting assemblies being rotatable about said supporting sleeve,

and retaining means for retaining said beam adjusting assemblies in stacked relation on said mounting sleeve,

said retaining means including a retaining ring mounted on said sleeve,

a camming ring rotatably mounted on said sleeve between said retaining ring and said beam adjusting assemblies,

spring means disposed between said retaining ring and said camming ring,

and camming means on said camming ring and operable by rotation of said camming ring for producing increased compression of said spring means to increase the clamping force exerted upon said beam adjusting assemblies.

4,065,738

DEFLECTION COIL UNIT COMPRISING TOROIDALLY WOUND COILS FOR A COLOR TELEVISION DISPLAY TUBE

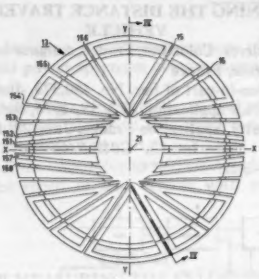
Marius J. A. Elders; Nicolaas G. Vink, and Cornelis van Steen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, Briarcliff Manor, N.Y.

Filed May 30, 1976, Ser. No. 701,310

Claims priority, application Netherlands, July 9, 1975, 7508146

Int. Cl.[2] H01J *29/66*

U.S. Cl. 335—213 4 Claims



1. A deflection coil unit for use with a colour television display tube, said tube comprising a neck portion, accommodating means for generating electron beams, and a flared portion which comprises a display screen at its widest end, said deflection coil unit comprising a ferromagnetic ring core whose inner surface is adapted to the flared shape, and also two deflection coil systems for deflecting the electron beams in the horizontal and the vertical direction respectively, at least one of the two deflection coil systems comprising a number of individual toroidally wound coils which are distributed along the circumference of the ring core, a part of at least some of the toroidally wound coils which extends along the inner surface of the ring core being situated substantially completely in a groove having two flat side walls, the plane of each of these two side walls being parallel to the axis of the ring core, the plane of at least one of the two side walls of at least one of the grooves not intersecting the axis of the ring core.

4,065,739

REVERSIBLE DIRECTION SOLENOID ASSEMBLY

Wolfgang Jaffe, Roselle Park, and Wesley Robinson Peterson, Bound Brook, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 28, 1976, Ser. No. 691,180

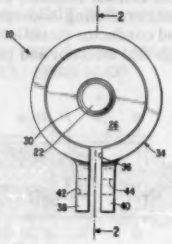
Int. Cl.[2] H01F *7/16*

U.S. Cl. 335—234 4 Claims

1. A solenoid assembly which includes a current carrying coil having a throughbore therein and an armature assembly slidably disposed within said coil bore, wherein said armature assembly comprises:

a. a core made of magnetic material; and

b. a flexible sheet wrapped around and attached to a porton of said core within said coil bore, said flexible sheet being



magnetizable material which has been permanently magnetized through its thickness.

4,065,740

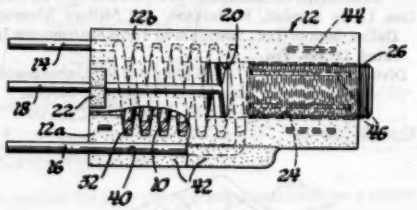
ELECTRICAL COIL ASSEMBLY

John E. Earhart; Frank D. Lachenmaier, and John E. McConnell, all of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 28, 1977, Ser. No. 781,674

Int. Cl.[2] H01F *21/06, 27/30*

U.S. Cl. 336—136 6 Claims



1. A dimensionally stable encapsulated electrical coil assembly comprising; an electrical coil having spaced coil turns formed of wire sufficiently stiff to render the coil initially self supporting but requiring further support for predetermined dimensional stability, the coil terminating in integral terminal leads extending away from the coil, a pair of insulating mating housing portions defining a parting line in a plane substantially on the axis of the coil secured together to enclose the coil, each housing portion having a plurality of integral ribs extending inwardly between the spaced coil turns and contacting the coil turns to securely contain the coil turns, the ribs being spaced about the axis of the coil to resist movement of the coil in the direction of the axis thereof, passages defined in at least one of the housing portions, and the said terminal leads extending through the passages, thereby providing a stable coil assembly surrounded by an insulating housing and having terminal leads extending therefrom.

4,065,741

THERMAL FUSE WITH A FUSIBLE TEMPERATURE SENSITIVE PELLET

Yoshimasa Sakamoto, Otsu; Sadayoshi Iwanari, Kusatsu, and Osamu Umene, Otsu, all of Japan, assignors to New Nippon Electric Co., Ltd., Osaka, Japan

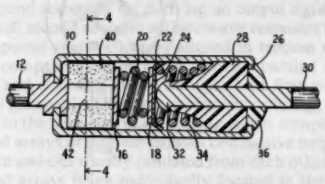
Filed Mar. 29, 1977, Ser. No. 782,415

Int. Cl.[2] H01H *37/76*

U.S. Cl. 337—407 6 Claims

1. A temperature responsive electric fuse comprising an electrically and thermally conductive housing having an open-ended portion, first conductor means secured to said housing, switch means located in said housing in a certain order, said

switch means including a temperature sensitive pellet fusible at a predetermined temperature, a first metallic retaining plate, a first compression spring, a second metallic retaining plate, a slidable resilient contact member, and a second compression spring, an insulator closing said open-ended portion of said housing, second conductor means including lead-in wire means passing through said insulator and having a contact portion at



the inner end thereof, and hermetical sealing means of insulating material integrally secured to said housing, to said insulator and to said second conductor means so as to electrically couple said first conductor means to said second conductor means through said resilient contact member, said pellet comprising means for accelerating the fuse action of the pellet to increase the reliability of the fuse when the temperature of said housing rises to a given point.

4,065,742

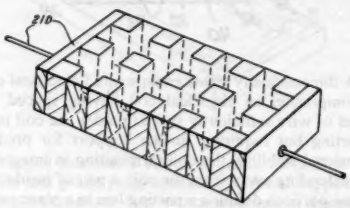
COMPOSITE SEMICONDUCTOR STRUCTURES

Don Leslie Kendall, Richardson, and Millard Monroe Judy, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 276,808, July 31, 1972, abandoned. This application June 23, 1975, Ser. No. 589,731

Int. Cl.[2] H01C 7/06; H01L 27/02, 29/06

U.S. Cl. 338—9 **4 Claims**



1. A temperature compensated resistor of a semiconductor material having a plurality of conductivities comprising in combination:

N-rows by M-columns of semiconductor mesas of one conductivity and one conductivity type, wherein N and M are integers; and

a second semiconductor material of a second conductivity and said first conductivity type interdisposed between and surrounding said means, wherein said one conductivity material and said second conductivity material having temperature coefficients of resistivity of opposite signs over a desired range of temperatures.

4,065,743

RESISTOR MATERIAL, RESISTOR MADE THEREFROM AND METHOD OF MAKING THE SAME

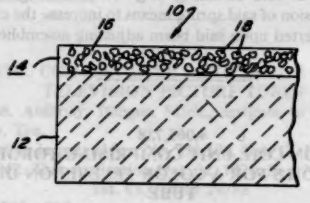
Richard L. Wahlers, Churchville, and Kenneth M. Merz, Gladwyne, both of Pa., assignors to TRW, Inc., Cleveland, Ohio

Filed Mar. 21, 1975, Ser. No. 560,785

Int. Cl.[2] H01C 1/012

U.S. Cl. 338—308 **28 Claims**

1. A vitreous enamel resistor material comprising a mixture of a glass frit and particles of a conductive phase, said conductive phase being selected from the group consisting essentially of (1) a mixture of tin oxide and tantalum oxide, and (2) a



mixture of tin oxide, tantalum oxide and the products resulting from heat treatment of said mixture of tin oxide and tantalum oxide.

4,065,744

DOPPLER NAVIGATION METHOD FOR DETERMINING THE DISTANCE TRAVELLED BY A VEHICLE

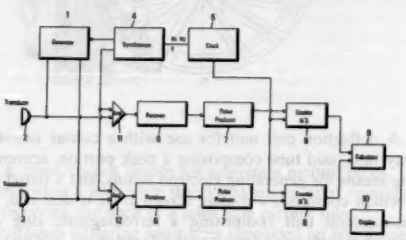
Robert Delignieres, Colombes, France, assignor to Institut Francais du Petrole, France

Continuation-in-part of Ser. No. 480,373, June 18, 1974, abandoned. This application May 19, 1976, Ser. No. 687,888

Claims priority, application France, June 28, 1973, 75.23595

Int. Cl.[2] G01S 9/66

U.S. Cl. 340—3 D **16 Claims**



1. A device for determinining the distance travelled by a vehicle movable with respect to a reference surface, comprising means for transmitting signals along at least one transmission direction inclined with respect to the reference surface, means for receiving echo signals corresponding to the transmitted signals on said surface, and means for measuring the distance travelled by the vehicle with respect to said surface, said transmitting means including memory means for storing repetitive data sequences, selection means for selecting the address of the data stored in said memory means and for controlling the extraction thereof, clock means for producing clock pulses defining time scales, means for producing signals whose frequencies are proportional to those of the clock frequencies and which depend on the values of the repetitive data sequences, and control means for activating the selection means in response to signals corresponding to the preselected values of said sequences.

4,065,745

DOPPLER SPEEDOMETER

Kermit Hamlin Robinson, Weston, Mass., assignor to Harnessed Energies, Inc., Maynard, Mass.

Filed May 11, 1976, Ser. No. 685,266

Int. Cl.[2] G01S 9/66

U.S. Cl. 340—3 D **27 Claims**

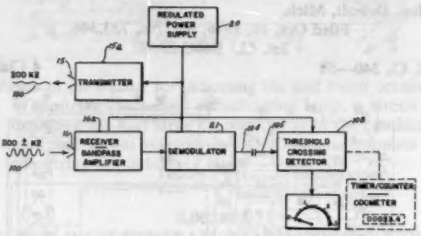
1. A device for determining the speed of a vehicle traveling

through a medium, with respect to the ground over which said vehicle is traveling, said device including

means for generating a carrier signal of predetermined frequency,

means for transmitting said carrier signal through said medium in a beam directed at said ground, the center of said beam being at a predetermined angle to the line of travel of said vehicle through said medium,

means for receiving said carrier signal reflected from said ground,



means for detecting the power spectrum of the reflected signal, said power spectrum being a function of speed of said vehicle,

means for detecting a characteristic of said power spectrum for providing an electrical value that is proportional to said characteristic, and

calibrated means responsive to said electrical value for indicating the speed of said vehicle with respect to said ground.

4,065,746

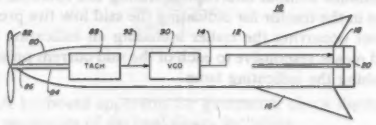
DEVICE FOR MEASURING THE VELOCITY OF A BODY IN AN UNDERSEA ENVIRONMENT

John R. Thompson, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 621,714, Oct. 14, 1975, Pat. No. 4,007,633. This application Oct. 18, 1976, Ser. No. 733,626

Int. Cl.[2] H04B *11/00*

U.S. Cl. 340—5 S **2 Claims**



1. An undersea apparatus for generating an acoustical a-c signal whose frequency is a function of said apparatus velocity in an undersea environment comprising:

a. a hollow projectile shaped body having a nose thereon, said body containing an acoustic transducer;

b. an impeller rigidly affixed to a shaft, said impeller being disposed outside said body, said shaft extending from inside said body through said body nose to said impeller, said shaft rotating with respect to said body, said impeller having a speed of rotation functionally related to the speed of said body in the water;

c. means connected to said shaft for generating a direct-current signal whose amplitude is functionally related to the speed of rotation of said impeller, said means being located inside said body;

d. a voltage-controlled oscillator connected to receive said direct-current signal and generate an a-c signal whose frequency is functionally related to the amplitude of said direct-current signal, said a-c signal driving said acoustic transducer, said oscillator located inside said body.

4,065,747

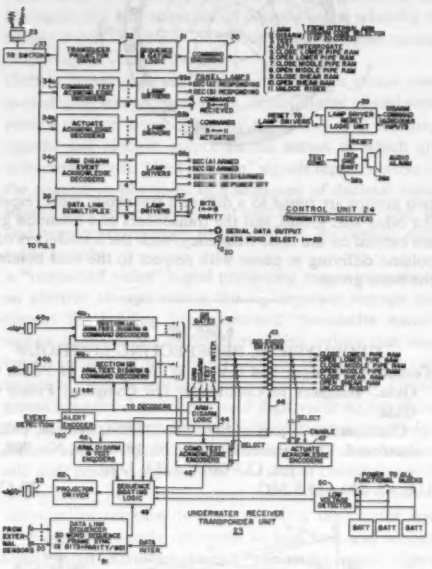
ACOUSTICAL UNDERWATER COMMUNICATION SYSTEM FOR COMMAND CONTROL AND DATA

Hudson Taylor Patten, Westlake Village, and Floyd Baylie Woodcock, Oxnard, both of Calif., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Nov. 28, 1975, Ser. No. 636,033

Int. Cl.[2] H04B *11/00*

U.S. Cl. 340—5 R **23 Claims**



1. A method for emergency communication from a control platform comprising the steps of transmitting from a transmitter-receiver through a transducer in the water near said platform an acoustic code to arm a receiver-transponder adjacent said underwater equipment; transmitting from said receiver-transponder an acknowledgement code to said transmitter-receiver via said transducer to indicate that said receiver-transponder is ready to receive acoustic command codes; transmitting one or more acoustic command codes from said transmitter-receiver to said receiver-transponder via said transducer; transmitting from said receiver-transponder acoustic acknowledgement codes for each acoustic command code received, and launching a diving vessel having a transducer and a transmitter preprogrammed to transmit acoustic command codes to said receiver-transponder as said vessel descends through the water, whereby said diving vessel penetrates through any turbulence in the water near said platform that might occlude acoustic communications to water near said underwater equipment that is free of any turbulence for reliable transmission of acoustic communication codes to said receiver-transponder.

4,065,748

TRANSMITTING AND RECEIVING MULTIPATH SONAR ANTENNA UTILIZING A SINGLE ACOUSTIC LENS

Pierre Maguer, Le Relecq-Kerhuon, and Jean Verveur, Plouzane, both of France, assignors to Etat Francais represente par le Delegue Ministeriel pour l'Armement, Paris, France

Filed June 21, 1976, Ser. No. 697,994

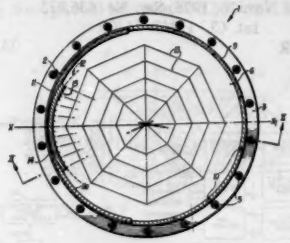
Claims priority, application France, June 20, 1975, 75.20203

Int. Cl.[2] H04B *13/00*

U.S. Cl. 340—9 **5 Claims**

1. A multipath, emitting and receiving sonar antenna com-

prising, in combination, an acoustic lens comprising a cylindrical enclosure filled with a fluid which focuses received acoustic beams on a focal surface, and at least two intercalated groups of columns of piezoelectric transducers placed on said focal surface, wherein the transducers of each of said at least



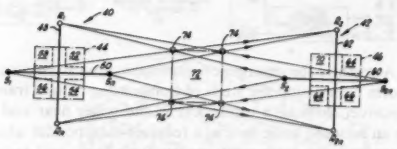
two groups are tuned to a different frequency with respect to the other said group, and the transducers of a common group are excited on the same frequency, with the transducers of one column differing in phase with respect to the next column of the same group.

4,065,749

GEOPHYSICAL PROSPECTING METHODS

Kenneth H. Waters, and George W. Rice, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 228,864, Feb. 24, 1972, abandoned. This application July 26, 1976, Ser. No. 708,766
Int. Cl.² G01V *1/13, 1/20*
U.S. Cl. 340—15.5 MC **28 Claims**



1. A method of geophysical prospecting to derive strike, dip, velocity and related data for a selected stratum underlying an earth area comprising the steps of:

disposing first and second source-receiver cross patterns at first and second spaced positions of said earth area, said cross patterns each including a plurality of aligned seismic energy sources with a plurality of seismic energy receivers positioned transversely thereto;

obtaining first and second local seismic trace data establishing reflection times for events reflected from said selected stratum underlying said first and second spaced positions;

obtaining offset seismic trace data establishing reflection times for events reflected from said selected stratum underlying said earth area at a position intermediate to said first and second spaced positions, said offset seismic trace data resulting from seismic energy emanating from one source-receiver cross pattern and detected at the other source-receiver cross pattern;

utilizing the first and second local trace data to produce parameter signals which define first and second planes under said first and second earth positions which best fit the reflection times of the first and second trace data, respectively, and

utilizing the offset seismic trace data to produce parameter signals which define a third plane under said intermediate earth position which best fits the reflection times of the offset trace data,

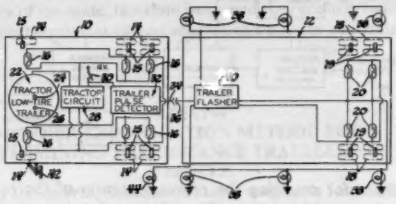
said first, second and third planes thereby representing the configuration of said selected stratum underlying said three earth positions, from which strike and dip of said selected stratum may be derived together with velocity of seismic energy between the earth's surface at said positions and the selected stratum.

4,065,750

LOW TIRE PRESSURE WARNING CIRCUIT FOR A TRACTOR/TRAILER COMBINATION

Eugene G. Duncan, Swartz Creek, and James W. Spaniola, Fenton, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 18, 1976, Ser. No. 733,346
Int. Cl.² B60C *23/02*
U.S. Cl. 340—58 **4 Claims**



1. In a tractor/trailer electrical circuit having an electrical power supply carried by the tractor and signal lamps carried by the trailer, a low tire pressure warning circuit for indicating in the tractor a low tire pressure event occurring in a trailer tire comprising

a conductive path for supplying electrical power from the power supply to energize the signal lamps,

means for sensing a low tire pressure event occurring in a trailer tire at each revolution of the low pressure tire and providing a corresponding pulsed event signal,

a flasher circuit connected to the said conductive path and effective when enabled for repetitively opening and closing the conductive path to periodically energize the lamps, whereby each time the lamps are energized a current pulse is produced in the conductive path,

a time delay means repsonsive to the pulsed event signal for continuously enabling the flasher circuit for a preset time after an event signal so that the flasher circuit operation continues without interruption during tire rotation, and

means in the tractor for indicating the said low tire pressure event occurring the trailer including an indicating lamp and means responsive to each of the said current pulses for flashing the indicating lamp.

4,065,751

WARNING CIRCUIT FOR A TRACTOR/TRAILER COMBINATION

John A. Stewart, Flint; Roy G. Hynes, Flushing; David G. Beyerlein, Flint, and John B. Force, Bancroft, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 18, 1976, Ser. No. 733,347
Int. Cl.² B60C *23/02*
U.S. Cl. 340—58 **3 Claims**

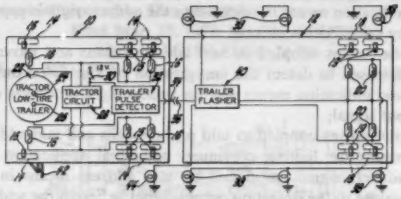
1. In a tractor/trailer electrical circuit having an electrical power supply carried by the tractor and signal lamps carried by the traler, a warning circuit for indicating in the tractor an event occurring in the trailer comprising

a conductive path for supplying electrical power from the power supply to energize the signal lamps,

means for sensing an event occurring in the trailer and providing a corresponding event signal,

means responsive to the event signal and connected to the said conductive path for repetitively opening and closing the conductive path at a low rate allowing the signal lamps to substantially cool when the path is opened and

the lamps are de-energized, whereby each time the lamps are energized a large current pulse is produced in the conductive path, and



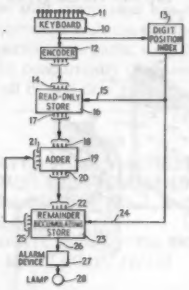
means in the tractor for indicating the said event occurring in the trailer including an indicating lamp, a circuit for detecting the said large current pulses in the conductive path and means responsive to the said large pulses for energizing the indicating lamp.

4,065,752

CHECK DIGIT GENERATION AND VERIFICATION APPARATUS

Leslie Louis Goldberg, 55, Portland Place, London, England

Division of Ser. No. 370,143, June 14, 1973, Pat. No. 3,913,067.
This application Oct. 10, 1975, Ser. No. 621,399
Claims priority, application United Kingdom, June 14, 1972, 27806/72
The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.
Int. Cl.[2] H03K *13/34*; G06F *11/10*; G06K *5/02*; H04L *1/10*
U.S. Cl. 340—146.1 AJ **16 Claims**



1. A keyboard apparatus for generating check digits for use with sequences of decimal digits, including

a. a plurality of manually-operable keys of which at least ten (referred to hereafter as decimal digit keys) represent the ten respective decimal digits,

b. a plurality of electric switching means associated with the respective decimal digit keys and operative to change from a first to a second switching state on operation of the associated decimal digit key,

c. electric encoding means having input circuit means connected with the respective switching means, and output circuit means at which are delivered electric "digit value" signals representative of the particular electric switching means then in said second switching state,

d. temporary storage means having input circuit means connected with said output circuit means of said encoding means for receiving therefrom said digit value signals, a plurality of separate storage addresses at which successive digit value signals received from the encoding means during the keying-in of a sequence of decimal digits on said decimal digit keys may be stored temporarily until all of the digits of the sequence have been keyed in, output signal control means, a first output circuit means at which in response to the delivery to said control means of a "sequence complete" control signal are delivered the respective digit value signals then stored in the successive storage addresses, in the sequence in which they had previously been stored in those addresses, and a second output circuit means at which an indexing signal is delivered each time a said digit value signal is delivered to said first output circuit means,

e. control signal generating means connected to said output signal control means and operable on completion of the keying-in of a said sequence of decimal digits whereby to supply a said "sequence complete" control signal to said output signal control means,

f. electric indexing means having input circuit means connected with said second output circuit means of said temporary storage means whereby to receive said indexing signals, and electric output circuit means at which are delivered electric "digit position" signals representative of the respective positions, in a sequence of decimal value signals then being delivered at said first output circuit of said temporary storage means, of the successive digit value signals,

g. a "remainder value" signal producing means comprising an electric storage means having separate storage addresses for holding predetermined "remainder value" signals for each of the respective digit values that may appear in each of the respective digit positions in a said sequence, which storage means has first input circuit means connected to receive said digit value signals from said first output circuit means of said temporary storage means, second input circuit means connected to receive said digit position signals from said output circuit means of said indexing means, and output circuit means at which is delivered in response to corresponding digit value and digit position signals delivered to said first and second input circuit means an electric "remainder value" signal obtained from a storage address corresponding to the digit value and digit position of a decimal digit which is represented by said corresponding digit value and digit position signals,

h. an electric "accumulated remainder value" signal storage means having an input circuit means, first and second output circuit means, and a reset circuit means connected to receive 'reset' signals from said output circuit means of said indexing means,

i. an electric adding means having a first input circuit means connected to receive signals from said output circuit means of said signal producing means, a second input circuit means connected to receive signals from said first output circuit means of said signal storage means, and an output circuit means connected to deliver "sum" signals to said input circuit means of said signal storage means, which "sum" signals represent the sum of the signals received at said first and second input circuit means, and

j. an output device connected to receive signals from said second output circuit means of said signal storage means, and having output circuit means at which are delivered, after operation of said control signal generating means whereby to provide a "sequence complete" signal, check digit signals representative of the deviation of the signal then stored in said signal storage means from the nearest multiple of a predetermined modulus number,

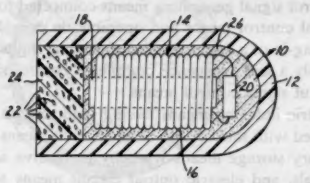
each said predetermined remainder value being the excess, over the nearest multiple of the modulus number, of the associated decimal digit value when multiplied by a predetermined multiplier dependent on the position in said sequence of the particular decimal digit.

4,065,753

ELECTROMAGNETICALLY RESPONSIVE PROJECTILE AND SYSTEM FOR DETECTING SAME

Fred R. Paul, Jr., Burnsville, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Sept. 9, 1974, Ser. No. 504,060
Int. Cl.[2] A61M *31/00*; G01S *9/02*
U.S. Cl. 340—152 T **11 Claims**



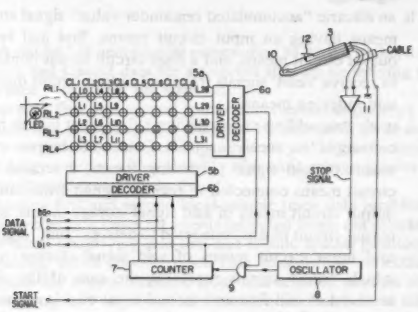
1. A projectile adapted to be shot toward and to threby be implanted into livestock such as cattle for thereafter enabling remote electromagnetic detection and identification of said livestock when they are in an interrogation zone, said projectile comprising a plastic body having outer dimensions including an external diameter of not greater than 0.3 inches (7.5 mm) and a length of not greater than 0.75 inches (19 mm), thereby enabling the non-lethal penetration of the projectile a short distance into said livestock and a passive electromagnetically responsive device sealed therewithin capable of providing an electromagnetic response to an external electromagnetic field to enable remote detection of said projectile.

4,065,754

INPUT DEVICE FOR PROCESSING SYSTEM PROBE CONTROLLED

Genmei Miura, Tokyo, and Kanou Takeshita, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1976, Ser. No. 650,007
Claims priority, application Japan, Jan. 22, 1975, 50-9531
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—166 R **7 Claims**



1. An input device for entering selected items of information into a processing system, comprising:

a plurality of conductors defining a matrix having intersecting row and column lines, each intersection of a row line and a column line corresponding to one of said items of information;

a plurality of indication means each one of which is coupled to a respective row and column line at corresponding intersections, wherein an indication signal is produced by each of said indication means in response to energization to corresponding row and column lines;

address means for generating address signals for application to sequentially energize each one of said indication means and to store a selected one of said address signals;

matrix driving means coupled to said address means and said conductors for selectively energizing each one of said indication means in response to the address signals applied by said address means;

probe means coupled to said address means and movably disposed to detect the energization of a selected one of said indication means and for producing a detection output signal;

inhibit means coupled to said probe means and said address means for halting continued sequential application the address signals produced by said address means in response to the detection output signal, wherein the address signal corresponding to the selected indication means is stored in said address means; and

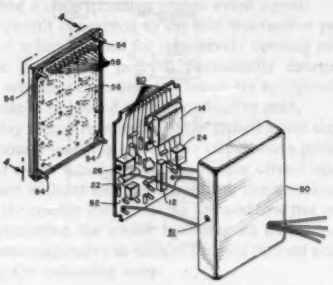
means coupled to said address means for deriving stored address signals for entry into the processing system as said selected items of information.

4,065,755

TOUCH-TONE ENCODER UNIT FOR MOBILE RADIO TRANSMITTER

Joseph P. Oliveira, II, 8060 Willoughby Ave., Hollywood, Calif. 90046

Filed Dec. 16, 1976, Ser. No. 751,033
Int. Cl.[2] H04M *11/00*
U.S. Cl. 340—171 PF **8 Claims**

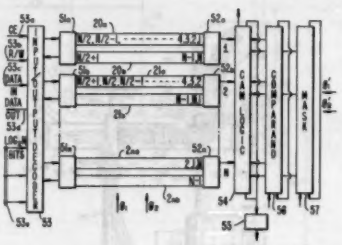


1. A Touch-Tone encoder unit comprising: a housing having an open front; a keyboard having a plurality of pushbutton switches thereon mounted in said housing and providing a closure for the open front thereof; a switching circuit board electrically connected to the pushbutton switches on the keyboard mounted on the rear face of said keyboard and contained within said housing; a further circuit board mounted in said housing adjacent to said switching circuit board and electrically connected thereto; a first circuit means including electric components and circuitry constituting an encoder generator circuit mounted on said further circuit board for producing dual tones as the pushbutton switches on the keyboard are individually depressed; second circuit means mounted on said further circuit board including electric components and circuitry connected to said first circuit means for limiting the duration of each dual tone generated thereby to a predetermined time interval independent of the time during which the corresponding pushbutton switch is depressed; and fastening means for securing said housing to said keyboard to hold the unit in an assembled condition.

4,065,756
ASSOCIATIVE MEMORY WITH NEIGHBORING RECIRCULATED PATHS OFFSET BY ONE BIT

Godavarish Panigrahi, East Windsor, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 15, 1976, Ser. No. 666,575
Int. Cl.[2] G11C *15/04, 21/00*
U.S. Cl. 365—49 11 Claims

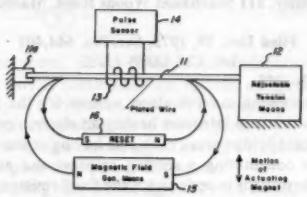


1. An associative memory comprising:
a plurality of circular dynamic memory data paths in each of which one or more series of bits representing words are serially stored such that corresponding significant bits in the respective paths are offset by one bit from corresponding bits in neighboring paths;
comparison logic;
a comparand shift register having individual bit positions being coupled by said comparison logic to individual ones of said memory data paths; and
timing means coupled to said data paths and to said comparand register to shift comparand bits in said comparand register in synchronism with the shifting of all of the data bits in said respective data paths, such that the comparand data bits will be concurrently compared with individual data bits from all of said data paths.

4,065,757
THIN FILM PLATED WIRE MAGNETIC SWITCH OF ADJUSTABLE THRESHOLD

Vahram S. Kardashian, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 7, 1976, Ser. No. 693,253
Int. Cl.[2] G11C *11/155*
U.S. Cl. 365—244 4 Claims

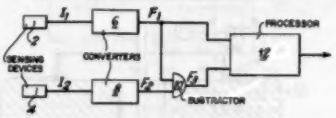


1. An adjustable-threshold bistable magnetically actuated switch for generating an electrical pulse at each switching event, comprising:
a length of wire substrate having an anisotropic magnetostrictive magnetic film covering the wire substrate, the magnetic film having an easy axis of magnetization oriented helically around the wire, the helical magnetization direction being reversible by the application to said switch of external magnetic fields of predetermined magnitude to change the state of the magnetically actuated switch between a first state and a second state and to generate an electrical pulse in said wire substrate with each reversal between said states, said film covered substrate being known as a plated wire;
adjustable tension means fastened to said plated wire for maintaining said plated wire under tension, the switching threshold level of said plated wire being a function of the magnitude of the tension exerted on said plated wire; and
pulse output terminals from said switch.

4,065,758
ALARM DETECTOR RESPONSIVE TO RATE OF CHANGE OF A MONITORED CONDITION

Daniel Barbier, Echirolles; Jean-Michel Ittel, Seyssinet-Pariset, and Robert Poujois, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 2, 1975, Ser. No. 538,218
Claims priority, application France, Jan. 4, 1974, 74.00295
Int. Cl.[2] G08B *17/06*
U.S. Cl. 340—227 R 15 Claims

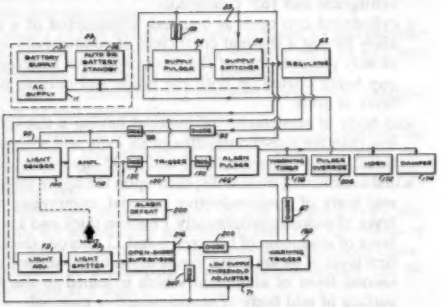


1. An alarm detector comprising:
a sensing device for converting a physical quantity to be detected into an electrical signal whose amplitude is representative of the intensity of said physical quantity,
means for measuring the rate of change of said electrical signal during a predetermined time period,
means for comparing the measured rate of change of said electrical signal with a preset threshold level, and
means for actuating an alarm when said measured rate of change exceeds said threshold level.

4,065,759
SMOKE DETECTOR

Theodore E. Handing, 114 Palo Verde Drive, Brownsville, Tex. 78520

Filed Jan. 7, 1976, Ser. No. 647,096
Int. Cl.[2] G08B *17/10*
U.S. Cl. 340—237.5 17 Claims



1. A smoke detector operating on the principle of interference of light by smoke comprising:
a. a smoke test chamber;
b. a source of D.C. power including an output and a ground;
c. a pulsed D.C. power supply including an input operationally connected to the source of D.C. power and an output;
d. a pulsed D.C. power supply regulator having an input operationally connected to the output of the pulsed D.C. power supply, and an output;
e. a smoke sensing means including a source of light and a

light receiver in fluid communication with the smoke test chamber and operationally connected to the output from the pulsed D.C. power supply regulator;

f. an alarm trigger having an input operationally connected to the output from the pulsed D.C. power supply regulator and to the output from the smoke sensing means;

g. an alarm pulser having an input operationally connected to the outputs from the alarm trigger and the source of D.C. power; and

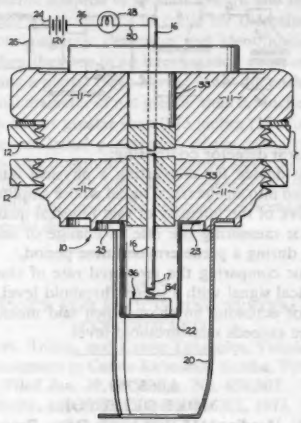
h. an alarm means having an input operationally connected to the output from the alarm pulser.

4,065,760

LIQUID LEVEL SENSOR

Arthur Feldon, Van Nuys, Calif., assignor to fea Devices, Inc., Van Nuys, Calif.

Filed Mar. 4, 1977, Ser. No. 774,621
Int. Cl.² G08B *21/00*
U.S. Cl. 340—244 R **12 Claims**



1. An oil level sensor comprising:

a body of semiconductive material having a peak electrical resistivity of between 100 ohm-cm and 200 ohm-cm, said peak resistivity occurring at a temperature between 150° centigrade and 165° centigrade;

a cylindrical cup open at one end, constructed of a metal alloy having a thermal coefficient of conductivity which closely matches that of the semiconductive material said cup being coated on both the inside and outside with a layer of gold;

said body of semiconductor material having a thickness of less than ten one-thousandths of an inch, and a cross sectional area of between 0.015 and 0.035 square inches;

a first conducting means, disposed upon the upper surface of said body of semiconductive material, comprising a first layer of nickel approximately 1 micron thick and a second layer of aluminum of between 6 and 12 microns thick, said first layer of nickel being joined to the upper surface of the second layer of aluminum which is joined to the upper surface of said body of semiconductive material;

a second conducting means, disposed upon the lower surface of said body of semiconductive material, comprising a first layer of nickel approximately 1 micron thick and a second layer of aluminum of between 6 and 12 microns thick, said first layer of nickel being joined to the lower surface of the second layer of aluminum which is joined to the lower surface of said body of semiconductive material;

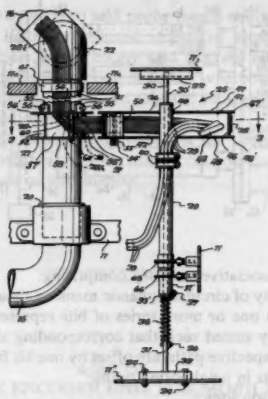
said first layer of nickel of said second conducting means being joined to the layer of gold on the interior bottom surface of said cup by a solder means less than two-thousandths of an inch thick.

4,065,761

ELECTRICAL INSTALLATION FOR FIRE ENGINE TOWER OR THE LIKE

Richard E. Young, Lancaster, and Timothy D. Ostolski, Buffalo, both of N.Y., assignors to Young Fire Equipment Corporation, Lancaster, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,345
Int. Cl.² G08B *21/00*; H01R *39/00*
U.S. Cl. 340—271 **14 Claims**



14. A construction comprising a body, a rotatable tower mounted on said body, a tower rotating circuit including continuous wiring connections between said body and said rotatable tower, signal means for indicating the extent to which said tower has been rotated from a predetermined position, an electrical connection in said tower rotating circuit, means for terminating said electrical connection to the tower rotating circuit when said tower has been rotated a given amount from said predetermined position, and means for overriding said means for terminating said electrical connection to the tower rotating circuit.

4,065,762

A.C. BRIDGE INTRUSION ALARM SYSTEM

John W. Walter, 511 Manhasset Woods Road, Manhasset, N.Y. 11030

Filed Dec. 29, 1975, Ser. No. 644,401
Int. Cl.² G08B *13/02*
U.S. Cl. 340—285 **4 Claims**

1. An alternating current alarm system for the protection against unauthorized intrusion having an alarm, comprising:

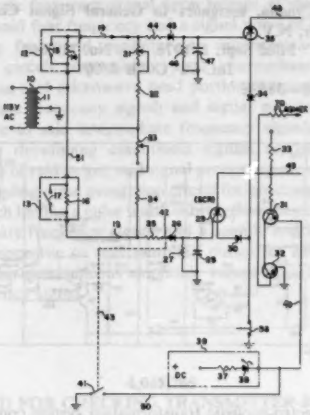
two adjacent bridge arms, each arm having at least one fixed resistor constituting a sensing resistor, and at least one variable resistor in series with the fixed resistor, constituting a balancing resistor, the combination constituting a rectangular connected electrical bridge circuit;

normally open switch means shunted across at least one of said fixed resistors, said switch means being open in a safe condition of the system and adapted to be closed during an unsafe condition thereof;

an alternating circuit transformer having a secondary winding connected to opposite points of said bridge arms of said bridge circuit, said secondary having a center tap winding connected to a common ground of the system, and

at least one diode connected to the intersection of each variable and fixed resistor in each bridge arm,

a pair of detection latch means each connected to the output of said diodes for detecting a change in the resistance



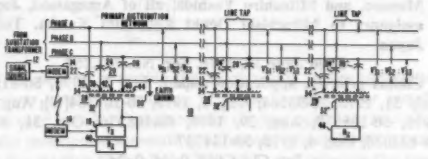
value of said bridge arms and for producing a current in response to said change which actuates said alarm.

4,065,763

DISTRIBUTION NETWORK POWER LINE COMMUNICATION SYSTEM

Ian A. Whyte, Churchill, and Paul H. Haley, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 8, 1975, Ser. No. 638,570
Int. Cl.[2] H04B *3/56*
U.S. Cl. 340—310 R **18 Claims**



1. A polyphase, power frequency, distribution network power line carrier communication system, comprising:

a plurality of distribution network power line conductors to which a carrier signal is to be coupled,

means providing a carrier signal having a frequency substantially higher than power frequency,

means coupling said carrier signal to each of said conductors to provide a predetermined proportional relationship between the carrier signals of said conductors,

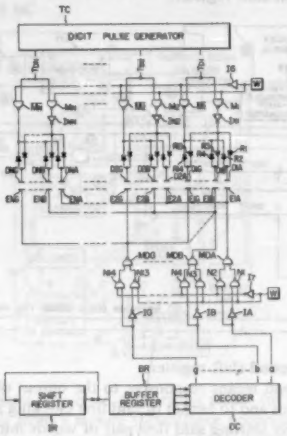
and impedance elements connected between said conductors remote from the signal coupling point, said impedance elements being devoid of connection to said means providing the carrier signal, other than through said distribution network power line conductors, said impedance elements being selected to present a high impedance to power frequency and substantially lower impedances to the frequency of the carrier signal, said impedance elements also being selected to re-establish said predetermined proportional relationship between the carrier signals of said conductors.

4,065,764

LIQUID CRYSTAL DISPLAY DEVICE

Sakae Houryu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1975, Ser. No. 637,027
Claims priority, application Japan, Dec. 3, 1974, 49-139227
Int. Cl.[2] G09F *9/32*
U.S. Cl. 340—324 M **2 Claims**



1. A liquid crystal display device comprising:

first register means for storing binary coded numeric information;

second register means coupled to said first register means for sequentially storing single digits of the binary coded numeric information stored in said first register means;

decoder means coupled to said second register means for converting the binary coded numeric information stored in said second register means into display information;

a plurality of first electrodes disposed on a first plate for energization to define a plurality of digits each having a seven bar display format;

a corresponding plurality of second electrodes disposed on a second plate which faces said first plate, each of said second electrodes corresponding, respectively, to ones of said first electrodes;

a plurality of first driving elements coupled to said decoder means and being operative to energize each of said first electrodes in response to said decoder output;

a plurality of second driving elements operative to energize each of said second electrodes;

means coupled to said first and second driving elements for alternating the polarity of driving voltage applied between said pluralities of electrodes from said driving elemenets; and

pulse generator means coupled to said second driving elements for sequentially selecting at least two electrodes of said second eiectrode so that only the electrodes corresponding to a particular portion of the display can be energized at a time.

4,065,765

PULSE-WIDTH DEMODULATOR AND INFORMATION STORAGE DEVICE

Peter B. Wagner, Reno, Nev., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 11, 1975, Ser. No. 603,777
Int. Cl.[2] G06F *3/00*
U.S. Cl. 340—347 DD **10 Claims**

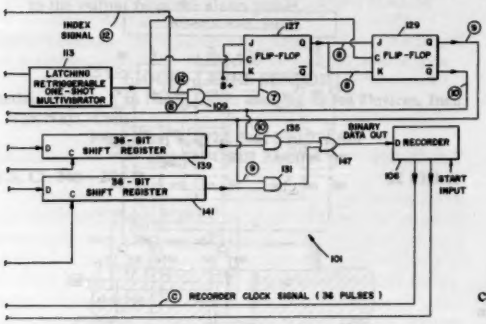
1. A pulse-width demodulator and information storage de-

vice for processing a series of at least a first pair and a second pair of pulse-width modulated words comprising:

a. first data means for receiving said pairs of pulse-width modulated words;

b. a first clocking means responsive to the output of said first means for generating first clock signal pulses that are synchronized with the pulses of said pairs of pulse width modulated words;

c. a first shift register;



d. a second shift register;

e. second means responsive to the output of said first data means and to output of said first clocking means for alternately shifting said first pair of words into said first shift register and then shifting said second pair of words into said second shift register; and

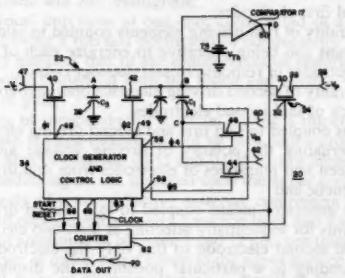
d. third means for alternately shifting said first pair of words out of said first shift register and then shifting said second pair of words out of said second shift register.

4,065,766

ANALOG-TO-DIGITAL CONVERTER

Walter J. Butler, Scotia, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,329
Int. Cl.[2] H03K *13/20*
U.S. Cl. 340—347 AD **17 Claims**



1. In an analog-to-digital converter of the type wherein an analog signal is converted to a digital signal by the transfer of charge into and out of a charge storage location including a linear portion and a nonlinear portion, the improvement comprising:

means for at least partially isolating said linear and said nonlinear portions of said charge storage location; and

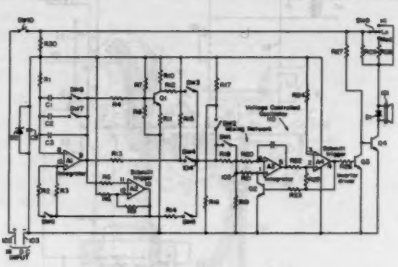
means operatively associated with said charge storage location for maintaining the net change in charge stored in said nonlinear portion of said charge storage location at zero from the beginning to the end of the measurement cycle.

4,065,767

PROGRAMMABLE ELECTRONIC SIREN

Jacob Neuhof, Norwalk, Conn., and Robert D. Scott, Owen Sound, Canada, assignors to General Signal Corporation, Rochester, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,644
Int. Cl.[2] G08B *3/00*
U.S. Cl. 340—384 E **14 Claims**



1. An electro-acoustic transformation system comprising in combination:

a. a loudspeaker having a permanent magnet field, a cone and a voice coil for responding to changing currents to move the cone and produce sound;

b. a transistor having its collector-emitter elements coupled in series with the voice coil of said loudspeaker and the series combination coupled across a d.c. power supply; and

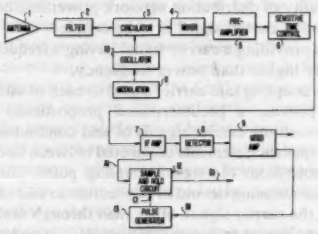
c. a voltage controlled oscillator coupled to the base of said transistor for providing a chopped d.c. potential having an on-time of the order of 25 percent to control the conduction of said transistor and concomitantly the current in the voice coil of said loudspeaker and the sound produced by said loudspeaker.

4,065,768

RADAR APPARATUS

Teruo Kondoh; Kazuhiro Ban; Akio Kawamoto; Yoshiki Masuno, and Mitsuhiro Yoshida, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed June 30, 1976, Ser. No. 701,252
Claims priority, application Japan, July 1, 1975, 50-81595; July 31, 1975, 50-93564; Aug. 1, 1975, 50-107384[U]; Aug. 29, 1975, 50-105375; Aug. 29, 1975, 50-105376; Oct. 31, 1975, 50-132030; Dec. 4, 1975, 50-144737
Int. Cl.[2] G01S *9/44, 9/24*
U.S. Cl. 343—9 **38 Claims**



1. A radar apparatus, comprising: a microwave head portion including an antenna adapted to transmit an electromagnetic wave of a first frequency and to receive a reflection wave from at least one target, an oscillator capable of selectively producing said first frequency and a second local oscillator frequency, said oscillator first frequency being connected to said antenna

to provide said electromagnetic wave, control circuit means for controlling the time of generation of said first and second frequencies by said oscillator, and a mixer for providing an intermediate frequency signal upon receipt of said reflection wave of said first frequency and a signal wave of said second frequency from said oscillator; an intermediate frequency amplifier circuit responsive to said intermediate frequency signal from said microwave head portion for amplifying said intermediate frequency signal; and signal processing means responsive to said intermediate frequency signals from said mixer for developing conditional signals representative of conditions of said target, said signal processing means comprising, a sampling pulse generation circuit for producing sampling pulses each having a pulse width shorter than the period of said intermediate frequency signal, and a sample and hold circuit means responsive to said sampling pulses for sampling and holding the instantaneous amplitude values of said intermediate frequency signal.

4,065,769

METHOD FOR CHECKING TRANSMITTER-RECEIVER REVERSING SWITCHES IN PULSE-DOPPLER RADAR DEVICES

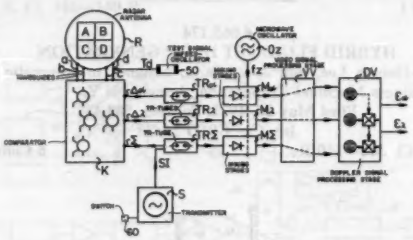
Pierino Pacozzi, Zurich, Switzerland, assignor to Siemens-Albis Aktiengesellschaft, Zurich, Switzerland

Filed July 19, 1976, Ser. No. 706,918

Claims priority, application Switzerland, Aug. 22, 1975, 10893/75

Int. Cl.[2] G01R *27/00*; G01S *7/40*

U.S. Cl. 343—17.7 **1 Claim**



1. A method of testing the functionality of the transmitter-receiver reversing switches of pulse-Doppler-radar installations used in pulse-Doppler-radar devices operating according to the monopulse-summation-difference principle, by measuring the relative throughpass damping, and wherein the transmitter-receiver reversing switches serve for the protection of receiver components during the supply of the transmitter line in the waveguide system, which method comprises the steps of:

delivering a microwave-test signal to the receiver system between the antenna and a subsequently connected comparator;

obtaining with the radar transmitter turned-on angle error voltage outputs in the form of a first azimuth angle error-voltage value and a first elevational angle-error voltage value;

obtaining a second azimuth angle-error voltage value and a second elevational angle-error voltage value with the radar transmitter turned-off; and

employing the presence of a difference between at least any one of the measured first azimuth angle-error voltage value and the measured second azmimuth angle-error voltage value, or between the measured first elevational angle-error voltage value and the measured second elevational angle-error voltage value, to indicate the presence of a defective transmitter-receiver reversing switch.

4,065,770

DIGITAL SCAN CONVERTERS

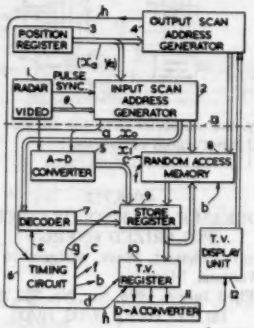
Thomas Royston Berry, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 7, 1976, Ser. No. 674,333

Claims priority, application United Kingdom, Apr. 17, 1975, 15973/75

Int. Cl.[2] G01S *7/04*

U.S. Cl. 343—5 SC **8 Claims**



1. A digital scan converter, comprising means for receiving response signals from a mobile surveillance apparatus; means for digitizing the said response signals and providing digital indications of the positions from which the response signals have been returned, in terms of coordinates related to the instantaneous position of the mobile surveillance apparatus; a position register for receiving and storing digital indications of the said instantaneous position; a random-access memory having a multitude of addressible locations in which the digitized response signals may be stored; input scan means for directing the digitized response signals into locations in the random-access memory whose addresses are derived from the said coordinates and the contents of the position register so that each digitized response signal is directed to a location whose address is a function of coordinates of the position from which it was returned to the surveillance apparatus; output scan means for reading out signals from the random-access memory according to a raster scan starting from a location whose address is a function of the contents of the position register; and video display means for providing a visual display in response to the signals read out by the output scan means.

4,065,771

RANDOM SCANNING RECEIVER

Joseph F. Gulick, Clarksville, and Donald R. Marlow, Highland, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 14, 1976, Ser. No. 723,258

Int. Cl.[2] H01Q *3/26*; G01S *3/42*

U.S. Cl. 343—100 SA **6 Claims**

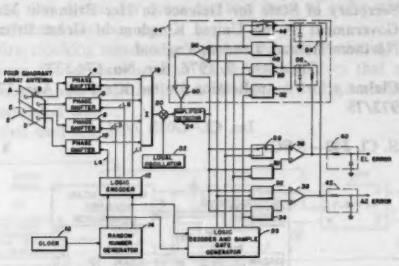
1. An array antenna receiver for tracking a signal source, comprised of:

means for detecting and amplifying the sum of signals received by all elements of the array, where each sum of signals corresponds to a pattern of array elements randomly selected to be phase-delayed with respect to the other elements,

means, having the detected and amplified sum of signals as an input, for generating an azimuth error signal and an elevation error signal, and

automatic gain control (AGC) feedback means, connected from the azimuth and the elevation error signals generat-

ing means output to provide an input to the amplifier-detector means, for controlling the level of signal produced by the amplifier-detector means by eliminating unwanted input signal variations.

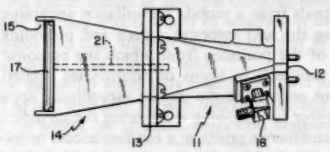


4,065,772

BROADBEAM RADIATION OF CIRCULARLY POLARIZED ENERGY

John M. Seavey, Cohasset, Mass., assignor to Adams-Russell Co., Inc., Waltham, Mass.

Filed July 6, 1976, Ser. No. 702,750
Int. Cl.[2] H01Q *13/00, 19/00*
U.S. Cl. 343—786 **13 Claims**



1. Apparatus for radiating elliptically polarized energy over a relatively broad frequency range comprising,

rear launching means having an input port and a square output port for exchanging polarized radiant energy at the input port with radiant energy polarized along a diagonal of the square portion at the output port,

flared horn means having parallel broad walls and a square input port connected to the rear launching means output port and a rectangular output aperture for exchangng linearly polarized energy polarized along said diagonal with elliptically polarized energy at said output aperture,

and a dielectric card in said flared horn portion perpendicular to the parallel broad walls of said horn portion for furnishing a frequency-varying differential phase shift between orthogonal components of wave energy inside said flared portion coacting therewith to substantially compensate for the inherent phase shift in the flare of said horn means for reducing the ellipticity ratio at said output aperture.

4,065,773

METHOD AND APPARATUS FOR GENERATING GRAY TONES IN AN INK JET PRINTER

James M. Berry, Deerfield, Ill., assignor to Teletype Corporation, Skokie, Ill.

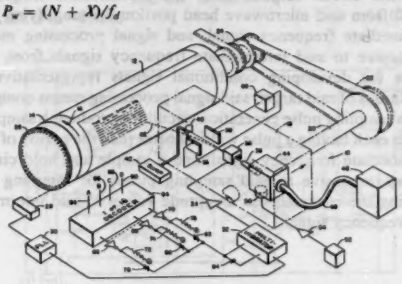
Filed Apr. 5, 1976, Ser. No. 673,561
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **4 Claims**

1. An apparatus for printing a selected number of ink drops upon a medium at a plurality of discrete dot locations by means of an ink jet which generates a stream of drops at a rate f_d comprising:

means for generating a signal related to the position of the ink jet with respect to each dot location, said signal generating means being asynchronous with respect to said drop rate f_d;

means responsive to said dot signal for generating a pulse in response thereto, the width P_w of said pulse being related to a selected tonal value and determined by the relationship:

$$P_w = (N + X)/f_d$$



wherein N is a whole number or zero and X is a fractional number less than one;

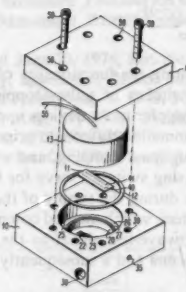
means responsive to said tonal pulse for directing a number of drops at a dot location on said paper so that the number of drops per dot in a series of dots having the same tonal pulse width P_w will vary by one and the overall tonal shade of the dot series will be equivalent to that which would be obtained by depositing fractional drops at each dot location in the series.

4,065,774

HYBRID FLUID JET DROP GENERATION

Chen-Hsiung Lee, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 30, 1975, Ser. No. 582,487
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—140 R **6 Claims**



1. In a fluid jet head including a fluid input connected to a source of pressurized fluid, a plurality of nozzle orifices, a cavity communicating with said input and with said nozzle orifices to eject a stream of fluid from each said orifices, and a signal input connected to a perturbation signal source, the improvement comprising:

a perturbation means connected to said signal input and mounted to both vibrate said nozzle orifices in an axial direction and vary the volume of said cavity in response to said perturbation signal, for perturbating the velocity of each said fluid stream to cause each said ejected stream to break into a serial stream of drops;

said perturbation means comprising an electromechanical

transducer for establishing a mechanical perturbation in response to said perturbation signal;

said perturbation means additionally forms a wall of said cavity vibrated by said mechanical perturbation to vary the volume of said cavity;

said nozzle orifices are located in another wall of said cavity and said wall is vibrated by said mechanically transmitted perturbation;

a cavity plate forming said cavity and said nozzle orifice locating wall of said cavity; and

a mounting block for clamping said electromechanical transducer between said block and said cavity plate;

for mechanically transmitting said mechanical perturbation to said nozzle orifices.

4,065,775

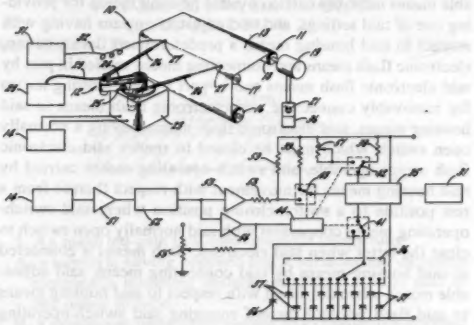
INK JET WITH UNIFORM DENSITY TRACE CONTROL FOR RECORDERS

Shou L. Hou, Barrington; Leonard P. Dague, Itasca, and Arun K. Agrawal, Elgin, all of Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 11, 1975, Ser. No. 639,644

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—140 R **1 Claim**



1. In a recorder having a variable speed chart paper drive, a pen motor having a response rate proportional to the signal being recorded, and a variable droplet rate ink jet pen which delivers ink droplets to the chart paper at a rate corresponding to a pen drive frequency, a control system comprising, in combination, a variable rate oscillator for delivering a pen drive signal to said pen through a frequency range from zero to approximately the highest response rate of said pen, a control for setting the speed of said chart paper drive, means responsive to the setting of said control for causing said oscillator to deliver a pen drive signal frequency proportional to movement of the chart paper so that, without pen movement, a uniform line is created by the pen through all chart speeds, means for differentiating said signal being recorded and developing an oscillator sweep controlling signal proportional to the rate of pen movement, and means including a switch for coupling said sweep controlling signal to said oscillator when a predetermined pen movement rate is exceeded so as to thereafter vary the oscillator signal frequency in proportion to the rate of pen movement.

4,065,776

CAMERA WITH AUTOMATIC FLASH EXPOSURE SYSTEM

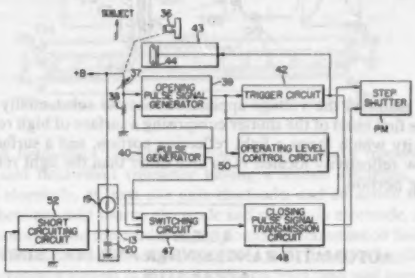
Hiroshi Iwata, Osaka, and Katsuji Ishikawa, Daito, both of Japan, assignors to West Electric Co., Ltd., Osaka, Japan

Filed Apr. 16, 1975, Ser. No. 568,521

Claims priority, application Japan, Apr. 18, 1974, 49-44102; Apr. 19, 1975, 49-44995

Int. Cl.[2] G03B *7/10, 7/16*

U.S. Cl. 354—23 D **6 Claims**



1. In a camera with an automatic flash exposure system, a combination comprising

a. an exposure control mechanism comprising

a plurality of shutter blades which also function as the aperture blades, and

driving means which rotates stepwise in response to driving pulses for opening and closing stepwise said shutter blades;

b. opening pulse generating means for generating and applying to said driving means the opening pulse signal consisting of one or plurality of pulses the number of which is dependent upon the signal representative of the distance to a subject generated by converting means operatively coupled to focusing means of the camera and upon the light flux to be produced by flash means so that said driving means causes said shutter blades to open so as to stop down the camera lens to the optimum *f*-number depending upon said distance and said light flux;

c. trigger means actuable in response to the last pulse of said opening pulse signal to generate the trigger signal for energizing said flash means; and

d. closing pulse signal generating means for generating and applying to said driving means the closing pulse signal consisting of one or a plurality of pulses equal in number to the pulse or pulses of said opening pulse signal a predetermined time after said shutter blades have been started to be opened, thereby causing said shutter blades to close, whereby said shutter blades may stop down the camera lens to an *f*-number depending upon the distance to the subject and the light flux to be produced by said flash means.

4,065,777

PHOTOMETRIC APPARATUS FOR SINGLE LENS REFLEX CAMERA

Yoshihisa Maitani; Kunio Shimoyama; Muneaki Yoshida; Akihiko Hashimoto, and Masahiro Kitagawa, all of Hachioji, Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan

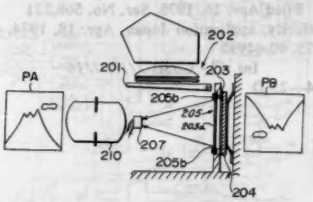
Division of Ser. No. 505,956, Sept. 13, 1974, Pat. No. 3,994,001. This application Aug. 24, 1976, Ser. No. 717,089

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—23 R **3 Claims**

1. A photometric apparatus for a single lens reflex camera and of the type in which an exposure value is determined by photometry of light which is transmitted through a photographic optical system and which is reflected by at least one of

the surfaces of a shutter blind and a film, comprising a photoelectric transducer element for receiving reflected light from at least one of the surface of a shutter blind and a film, and an operational amplifier for biasing the transducer element so as



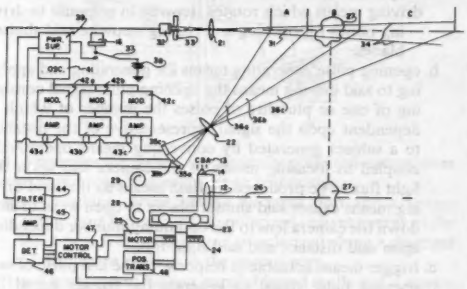
to maintain the voltage applied thereacross substantially null the first blind of the shutter comprising a surface of high reflectivity which forms a light reflecting portion, and a surface of low reflectivity located at an area other than the light reflecting portion.

4,065,778

AUTOMATIC RANGEFINDER AND FOCUSING APPARATUS

Donald Malcolm Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 17, 1976, Ser. No. 696,958
Int. Cl.[2] G03B *7/10*
U.S. Cl. 354—25 **6 Claims**



1. An automatic rangefinding device for use in a photographic camera having an objective lens that is adjustable to different focal positions, said device comprising:

a. path defining means defining a predetermined light reception path along which light is transmitted to said rangefinding device,

b. light emitting means spaced from said reception path and adapted to emit light in angular intersecting relation to said reception path to illuminate an object located along a predetermined portion of said reception path, whereby a portion of the light emitted by said light emitting means and iluminating said object is reflected by said object along said reception path,

c. light source characterizing means for providing the light emitted by said light emitting means with a first predetermined characteristic selected to distinguish that light from light originating from other sources,

d. interception location characterizing means for providing the light emitted by said light emitting means with a second characteristic distinguishable from said first characteristic and functionally related to the location along said portion of said reception path at which such light intercepts said path,

e. photoresponsive means for receiving light transmitted along said reception path, said photoresponsive means being adapted to respond only to light having said first predetermined characteristic to produce an electrical output corresponding to said second characteristic when said photoresponsive means receives light having both of said characteristics,

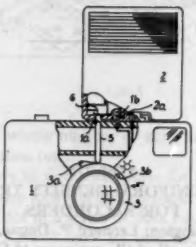
f. lens focusing means for automatically adjusting the focal position of said objective lens as a function of said electrical output.

4,065,779

CAMERA WITH ELECTRONIC FLASH DEVICE

Karl Heinz Lange, Bunde, Germany, assignor to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co., KG, Bunde, Germany

Filed Nov. 15, 1976, Ser. No. 742,392
Claims priority, application Germany, Nov. 29, 1975, 2553843
Int. Cl.[2] G03B *15/05*
U.S. Cl. 354—145 **7 Claims**



1. In a camera which is adapted to make exposures according to aperture, distance, and exposure-time settings and which also is adapted to make flash exposures, housing means, adjustable means movably carried by said housing means for providing one of said settings, and said adjustable means having with respect to said housing means a predetermined flash position, electronic flash means and connecting means carried in part by said electronic flash means and in part by said housing means for removably connecting said electronic flash means to said housing means, said electronic flash means having a normally open switch which must be closed to render said electronic flash means operable, and switch-operating means carried by said housing means for movement with respect thereto from a rest position to a switch-closing position where said switch-operating means cooperates with said normally open switch to close the latter when said electronic flash means is connected to said housing means by said connecting means, said adjustable means when displaced with respect to said housing means to said flash position thereof engaging said switch-operating means for displacing the latter to said switch-closing position thereof for rendering said electronic flash means operable when said adjustable means is placed in said flash position thereof.

4,065,780

TUNNEL INJECTION OF MINORITY CARRIERS IN SEMI-CONDUCTORS

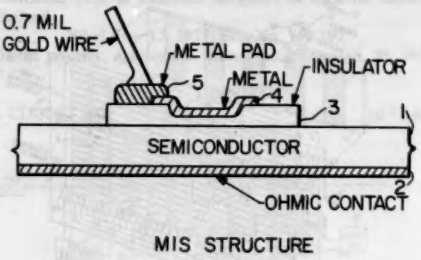
Joseph M. Ballantyne, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,406
Int. Cl.[2] H01L *49/02, 33/00*
U.S. Cl. 357—6 **8 Claims**

1. In a multilayer thin-film device having adjacent insulator and semiconductor layers and producing an increased luminescence efficiency, the improvement which comprises:

means to maintain a charge near the insulator-semiconductor interface of proper polarity and sufficient magnitude to create a depletion region in said semiconductor layer that

substantially reduces majority carrier tunneling from the conduction band of said semiconductor layer and enhances minority carrier injection into said semiconductor layer and the resulting luminescence.



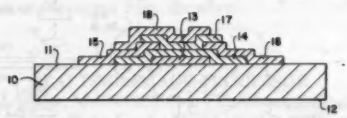
MIS STRUCTURE

4,065,781

INSULATED-GATE THIN FILM TRANSISTOR WITH LOW LEAKAGE CURRENT

Peter Gutknecht, Liebefeld, Switzerland, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 21, 1974, Ser. No. 481,729
Int. Cl.² H01L *29/78, 27/12*
U.S. Cl. 357—23 **8 Claims**



1. An insulated-gate thin film transistor comprising:

A. a substrate having opposed major surfaces and including electrically insulating material adjoining at least part of one major surface;

B. a conductor layer of an electrically conductive material disposed on at least one major surface of the substrate adjoining an electrically insulating material to form a gate electrode;

C. an insulator layer of an electrically insulating material disposed on the conductor layer;

D. source and drain electrodes of electrically conductive material disposed on the insulator layer, said source and drain electrodes being spaced away from each other;

E. a first thin semiconductor layer of semiconductor material in contact with said source and drain electrodes and in contact with said insulator layer at least between said source and drain electrodes; and

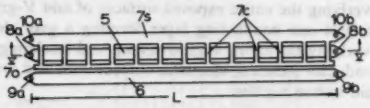
F. a second thin semiconductor layer of semiconductor material in contact with the source electrode without contacting said drain electrode and in contact with said first semiconductor layer at least between said source and drain electrodes, said second semiconductor layer being of the opposite type conductivity from the first semiconductor layer and forming a PN junction with said first semiconductor layer between the source and drain electrodes.

4,065,782

FIELD-EFFECT TRANSISTORS

Kenneth Walter Gray, and Huw David Rees, both of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 15, 1976, Ser. No. 732,823
Claims priority, application United Kingdom, Oct. 17, 1975, 42825/75
Int. Cl.² H01L *29/80, 29/78, 29/06, 23/48*
U.S. Cl. 357—23 **8 Claims**



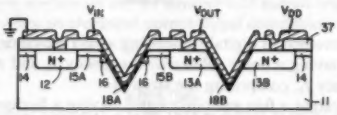
1. A field-effect transistor operable at microwave frequencies, said field-effect transistor having a source electrode, a drain electrode, at least one gate electrode, and an active region between said source electrode and said drain electrode, at least some of said electrodes being elongated transmission lines which have substantial length compared with the wavelengths of microwave signals in said transmission lines, and said transmission-line electrodes extending transversely to the direction of carrier flow from said source electrode to said drain electrode across said active region, whereby in use the phases of signals in said transmission-line electrodes vary continuously with distance along said active region in the direction transverse to the said direction of carrier flow.

4,065,783

SELF-ALIGNED DOUBLE IMPLANTED SHORT CHANNEL V-GROOVE MOS DEVICE

Paul Hsiung Ouyang, 950 Larkspur Ave., Sunnyvale, Calif. 94086

Filed Oct. 18, 1976, Ser. No. 732,551
Int. Cl.² H01L *27/04, 29/78*
U.S. Cl. 357—41 **28 Claims**



1. A self-aligned insulated gate field effect transistor device, comprising:

a. a lightly p-doped semiconductor body having a surface portion and containing an acceptor dopant concentration of about 10^{13} to 5×10^{15} atoms per cubic cm,

b. N-type diffused drain and source regions selectively located beneath and extending to said surface portion of said semiconductor body,

c. a V-groove adjacent said surface portion and extending into said semiconductor body intermediate said drain and said source regions, said V-groove having first and second side surfaces and first and second end surfaces,

d. a first, thin N-type, layer forming a source extension located beneath said surface portion of semiconductor body extending from said source to said first side surface of said V-groove,

e. a second, thin N-type, layer forming a drain extension located beneath said surface portion extending from said drain to said second side surface of said V-groove,

f. a third, p-type, layer forming a portion of the channel of said transistor, having an acceptor dopant concentration higher than that of said substrate, selectively located beneath portions of said first and said second layers in said

semiconductor body and terminated on all four surfaces of said V-groove,

g. a fourth, thin p-type, layer forming a channel stopper, having an acceptor dopant concentration higher than that of said semiconductor body but lower than that of said first layer, said second layer, said source region and said drain region, located adjacent to and beneath said surface portion of said semiconductor body, and surrounding said first and said second layers, said drain region, said source region, and said V-groove,

h. at least one insulating layer forming a gate dielectric overlying the entire exposed surfaces of said V-groove,

i. at least one conducting layer forming a gate electrode overlying the entire V-groove atop said insulating layer,

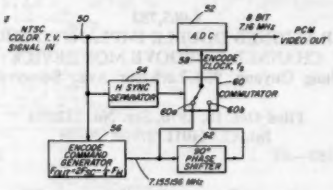
j. conductor means in electrical contact with said drain and said source regions.

4,065,784

METHOD AND APPARATUS FOR PCM-ENCODING NTSC COLOR TELEVISION AT SUB-NYQUIST RATE

John P. Rossi, New York, N.Y., assignor to CBS Inc., New York, N.Y.

Filed Sept. 29, 1976, Ser. No. 727,819
Int. Cl.[2] H04N *9/32*
U.S. Cl. 358—13 **9 Claims**



1. A method of digitally encoding an NTSC color television signal having a color subcarrier frequency f_{sc} and a line-scan frequency f_h, comprising the steps of:

generating a first sampling signal having a frequency f_s that differs from $2f_{sc}$ by $\frac{1}{2}f_h$,

sampling the television signals in response to the sampling signal, and

converting the sampled television signal into digital form.

4,065,785

SINGLE SENSOR TIME ENCODED COLOR IMAGING SYSTEM

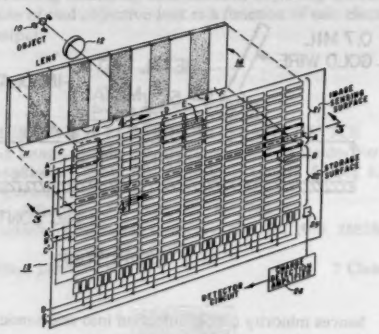
Willis A. Adcock, and Frank L. Skaggs, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 28, 1976, Ser. No. 700,431
Int. Cl.[2] H04N *9/04, 9/07*
U.S. Cl. 358—44 **31 Claims**

27. A color charge transfer imager device comprising, in combination:

a. a charge transfer imaging array having an image receiving surface; and

b. a color filter disposed adjacent to the image receiving surface of said array, said filter having a plurality of regions, first ones of said regions passing two primary colors of light, second ones of said regions passing another two



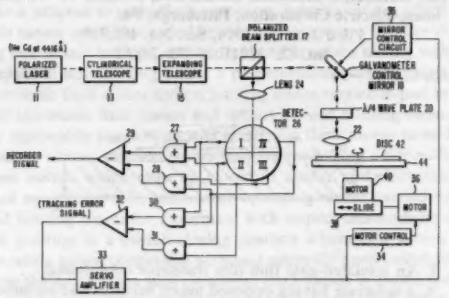
primary colors of light and third ones of said regions only one primary color of light.

4,065,786

VIDEODISC PLAYBACK SYSTEM

Wilber Clarence Stewart, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 30, 1975, Ser. No. 618,228
Int. Cl.[2] H04N *5/76*
U.S. Cl. 358—128 **13 Claims**



1. An optical playback system for recovering from a record data recorded in an elongated information track on said record, said information track comprising a succession of depressed areas of a given width of a given depth, and of variable lengths, alternating along the length of said information track with relatively non-depressed areas; said system comprising:

a. means for focusing a light spot on said information track, said focused light spot having a first dimension in a direction transverse to the length of said information track which is significantly less than said given width;

b. means for establishing relative motion between the information track and said focused light spot; and

c. light detection means, responsive to the diffraction of said focused light by said information track during the occurrence of said relative motion, for developing electrical signals representative of said recorded data; wherein said light detection means includes means for responding to the overlap of an undeviated zero diffraction order of said diffracted light with one of the plus and minus deviated first diffraction orders thereof to the relative exclusion of the overlap of said zero diffraction order with the other of the plus and minus deviated first diffraction orders.

4,065,787

TIME BASE CORRECTOR

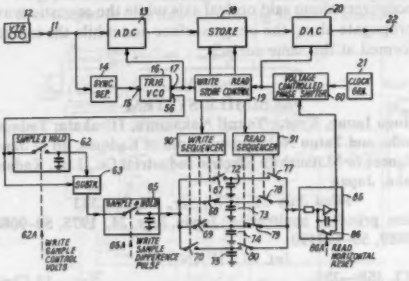
David Peter Owen, Newbury, and Barry Donald Ruberry Miles, Thatcham, both of England, assignors to Quantel Limited, England

Filed Jan. 17, 1977, Ser. No. 760,197

Claims priority, application United Kingdom, Jan. 28, 1976, 3207/76

Int. Cl.[2] H04N 5/79

U.S. Cl. 358—160 10 Claims



8. A method of compensating for velocity errors in a video time base corrector including an analogue-to-digital converter, a digital store, a digital-to-analogue converter, a triggered voltage controlled input oscillator and an output oscillator, said method comprising:

a. detecting the input oscillator controlling voltage during one line;

b. measuring the difference between the voltage detected during successive lines;

c. retaining the voltage difference measured for at least one line; and

d. phase shifting the output oscillator in dependance on the voltage difference to provide compensation for velocity errors at the output from the store.

4,065,788

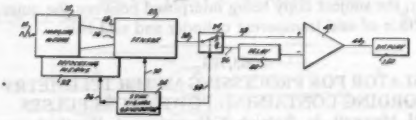
REALTIME IMAGE PROCESSOR

Michael J. Meier, Monrovia; Edward C. Adams, La Palma, and Richard W. Lindberg, Garden Grove, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Feb. 9, 1976, Ser. No. 656,413

Int. Cl.[2] H04H 5/38

U.S. Cl. 358—166 22 Claims



1. For use in a system in which a photosensor repeatedly produces electrical signals embodying an image in response to applied gating signals, apparatus for enhancing the image, comprising:

a. optical means for forming an image on the photosensor and operable to periodically defocus the image in response to an applied defocusing signal;

b. storage means, connected to the photosensor, for generating a reproduction of the electrical signals produced by the photosensor delayed by a predetermined amount; and

c. differencing means connected to said storage means and to the sensor for producing an output difference signal representing the difference between the delayed and undelayed electrical signals produced by the photosensor; whereby signals representing defocused image and signals representing a focused image are subtracted to produce an output signal.

4,065,789

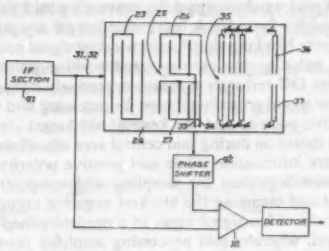
SURFACE WAVE DEVICE FOR USE IN A GHOST CANCELLATION SYSTEM

Adrian J. DeVries, Elmhurst, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 5, 1977, Ser. No. 757,118

Int. Cl.[2] H04N 5/21; H03H 7/30; H01V 7/00

U.S. Cl. 358—167 21 Claims



1. An acousto-electric surface-wave signal translating device comprising:

an acoustic surface-wave propagating medium;

an input surface-wave transducer coupled to said medium and responsive to an input signal for propagating a uniform acoustic surface-wave along a predetermined path in said medium;

an output surface-wave transducer coupled to said medium along said path and spaced from said input transducer for developing an output electrical signal only in response to non-uniform exposure to surface-waves; and

reflection means coupled to said medium along said path and spaced from said input and output transducers, said reflection means being responsive to said uniform surface-wave for initiating reflections along said path comprising non-uniform surface-waves for causing said output transducer to develop an electrical output signal comprising delayed replica of said input signal.

4,065,790

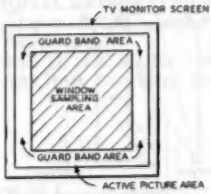
VIDEO PROCESSING AMPLIFIER PROVIDING BLACK LEVEL CORRECTION

Eric Siegel, 301 100 St., Brooklyn, N.Y. 11209

Filed Nov. 17, 1976, Ser. No. 742,661

Int. Cl.[2] H04N 5/18

U.S. Cl. 358—172 15 Claims



1. In a video processing amplifier having means for receiving a composite video signal input having predetermined video signal characteristics including black level composite sync and composite blanking signals, and means for correcting for any black level distortion present in said composite video signal input for restoring said black level to a substantially undistorted video signal black level, said composite sync signals comprising horizontal and vertical sync and said composite

blanking signal comprising horizontal and vertical blanking signals; wherein the improvement comprises means operatively connected between said composite video input signal receiving means and said black level restoration means for removing said sync and blanking signals from said composite video signal input prior to said black level distortion correction and restoration; and said black level distortion correction and restoration means comprises means for providing a window signal positionable in a central area of the associated video picture produceable from said composite video signal input, said window signal having an associated width greater than an associated width of said vertical blanking signal and an associated width of said horizontal blanking signal by a predetermined amount, said predetermined amount providing a guard band about said window signal for preventing said video processing amplifier from black level sampling of any portion of said composite blanking signal, said window signal comprising a window pulse having an associated positive polarity, and keyed clamp DC restoration means operatively connected to said window signal providing means for receiving said window pulse positive polarity and for keying said keyed clamp DC restoration means on during said central area of said associated video picture information while said positive polarity of said window pulse is present for sampling said composite video signal input and clamping the blackest negative excursions of said composite video signal input to a predetermined positve voltage level, whereby said processing amplifier provides an output composite video signal having said black level restoration.

4,065,791

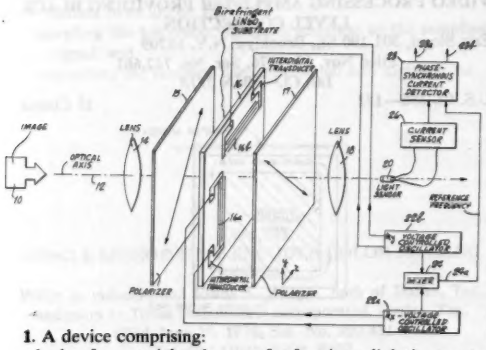
INTERACTION OF IMAGES WITH STRAIN WAVES TO DERIVE FOURIER TRANSFORM COMPONENTS OF THE IMAGES

Stephen T. Kowel, Liverpool, and Phillipp G. Kornreich, North Syracuse, both of N.Y., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 493,990, Aug. 1, 1974, which is a continuation of Ser. No. 319,680, Dec. 29, 1972, abandoned, and a continuation-in-part of Ser. No. 499,606, Aug. 22, 1974, which is a continuation-in-part of Ser. No. 493,990, Aug. 1, 1974, and Ser. No. 434,102, Jan. 17, 1974, abandoned, and Ser. No. 365,054, May 30, 1973, Pat. No. 3,836,712, and Ser. No. 576,433, May 12, 1975. This application June 29, 1976, Ser. No. 700,836

Int. Cl.[2] H04N *3/14*

U.S. Cl. 358—213 **6 Claims**



1. A device comprising:

a body of a material and means for forming a light image at a selected image surface of the body;

means for generating at least two acoustic waves propagating along said image surface of the body at intersecting directions and having individually controllable frequency characteristics;

means for deriving electrical signals having frequency characteristics determined by the combination of the frequency characteristics of the two acoustic waves and having electrical parameters representative of the two-dimensional spatial Fourier transform characteristics of the image formed at said image surface of the body;

wherein the body of material comprises an elasto-birefringent substrate having a surface defining said image surface and a first and a second polarizer crossed with respect to each other and flanking the substrate along an optical axis transfers to and intersecting said image surface, and the deriving means comprise means for measuring the light emerging from the combination of the substrate and the polarizers along said optical axis while the acoustic waves propagate along the image surface and while the image is formed at the same surface.

4,065,792

FACSIMILE SYSTEM

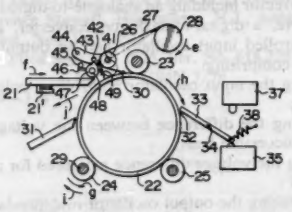
Toshitugu Inoue, Kyoto; Takuji Nakamura, Hirakata; Tadayuki Onoda, and Tatuo Nakatugawa, both of Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed July 21, 1976, Ser. No. 707,343

Claims priority, application Japan, July 24, 1975, 50-90887, 50-90889, 50-103190

Int. Cl.[2] H04N *1/08*

U.S. Cl. 358—286 **12 Claims**



1. A facsimile system comprising a rotatably supported transparent cylinder around which is wrapped a subject copy to be transmitted, a belt having the width extended in the axial direction of said transparent cylinder, one side edge of said belt being securely attached to the surface of said transparent cylinder in the axial direction thereof while an edge of the opposite side is resiliently biased to oppose the extension or drawing of said belt, a pressure roller for pressing said belt against said transparent cylinder, means for selectively moving said pressure roller toward or away from said transparent cylinder, means for rotating said transparent cylinder, and scanning means adapted to rotate and to be displaced in said transparent cylinder, the subject copy being interposed between the outer side surface of said transparent cylinder and said belt.

4,065,793

TRANSLATOR FOR PROCESSING METER TELEMETRY RECORDING CONTAINING POWER LOSS PULSES

Albert H. Maxwell, Jr., Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 21, 1975, Ser. No. 624,348

Int. Cl.[2] G01D *15/12*

U.S. Cl. 360—6 **7 Claims**

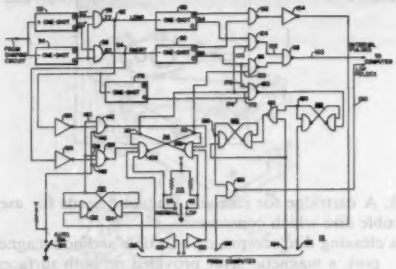
1. A translator for processing meter telemetry magnetic recording tapes containing time interval and power loss pulses recorded in either of two formats, wherein a first format includes the time interval pulses and the power loss pulses recorded with first and second waveforms, respectively, and wherein a second format includes only time interval pulses recorded with one of said first and second waveforms, said translator comprising:

pulse shaping means receiving the recorded waveforms and producing a first signal pulse corresponding to said first waveform and a second signal pulse corresponding to said

second waveform, said first signal pulse having a longer duration than said second signal pulse;

pulse duration recognizing means receiving said first and second signal pulses and producing an output pulse at a first terminal only when said first signal pulse is applied to the recognizing means and further producing an output pulse at a second terminal only when said second signal pulse is applied to the recognizing means;

first gating means responsive to said output pulses produced at both of said first and said second terminals and transferring pulses corresponding to the time interval pulses to a first output for further processing in the translator;



a second gating means responsive to said output pulses produced at one of said first and second terminals and transferring a pulse corresponding to a power loss pulse to the a second output for further processing in the translator; and

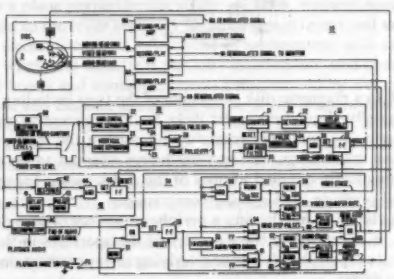
means selectively enabling and disabling said first and second gating means in at least two conditions, said first condition effecting response to said second recording format to only produce said time interval pulses at said first output, and said second condition effecting response to recordings in said first format to produce said time interval pulses and said power loss pulses at said first and second outputs, respectively.

4,065,794

PLAYBACK TECHNIQUE FOR AN AUDIO-VIDEO PROGRAM WHEREIN THE VIDEO DISPLAY IS CONTROLLED BY SIGNALS RECORDED AS A PART OF THE AUDIO PROGRAM

Harold B. Shutterly, Edgewood Boro., Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 4, 1975, Ser. No. 637,552
Int. Cl.[2] H04N *5/785;* **G11B** *27/30*
U.S. Cl. 360—10 **9 Claims**



1. A method for reproducing the audio frames or fields and the video frames or fields of an audio/video program from sequential access storage media wherein the audio frames consist of audio lines of time compressed audio information in television line format and video change signals indicating the time for displaying the video frames corresponding to the audio, comprising the steps of:

reproducing audio frames consisting of audio lines of time compressed audio information in television line format including video change signals indicating the time for displaying the video frames corresponding to the audio,

detecting the presence of the video change signals in each reproduced audio frame, and

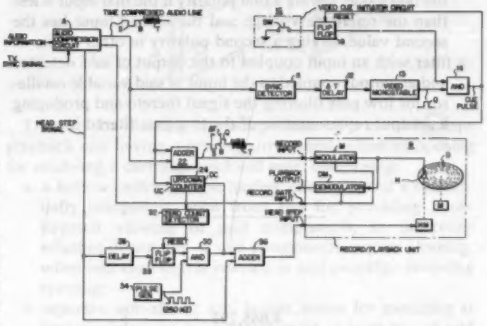
reproducing the video frames corresponding to each reproduced audio frame in response to the detected video change signals.

4,065,795

RECORDING TECHNIQUE FOR AN AUDIO/VIDEO PROGRAM WHEREIN THE AUDIO INCORPORATES VIDEO CHANGE SIGNALS

Harold B. Shutterly, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 4, 1975, Ser. No. 637,551
Int. Cl.[2] H04N *5/785;* **G11B** *27/30*
U.S. Cl. 360—35 **3 Claims**



1. A method for recording the audio frames or fields and the video frames or fields of an audio/video program on a sequential access storage medium, comprising the steps of:

recording audio frames consisting of compressed audio information in television line format on the sequential access storage medium,

inserting video change signals at predetermined locations within the recorded audio frames, and

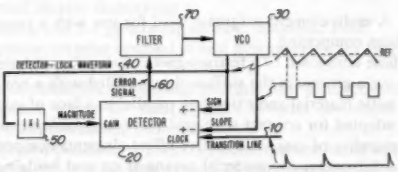
recording video frames corresponding in number to said predetermined number of video change signals in a sequential manner on said sequential access storage medium following said recorded audio frames.

4,065,796

DIGITAL DATA DECODER

Scott Alan Dehart, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 22, 1976, Ser. No. 725,210
Int. Cl.[2] H04L *7/00;* **G11B** *5/09*
U.S. Cl. 360—51 **6 Claims**



1. A synchronizer responsive to an input signal, which includes a sequence of reproducible changes; the synchronizer comprising:

a variable oscillator having an input and first and second outputs, for producing a periodic triangle waveform on the first output having a frequency responsive to a signal applied to the input, and for producing a signal on the second output having a first or a second value corresponding to a positive or negative slope on the first output, respectively;

a magnitude detector with an input and an output, the input responsive to the first output of said variable oscillator, for producing an output signal responsive to the absolute magnitude of the difference between the input thereto and a reference value;

circuit means with first and second inputs coupled to the first and second outputs of said variable oscillator, respectively, a third input coupled to the output of said magnitude detector, a fourth input responsive to the input signal, and an output, for generating an output signal upon the detection of a reproducible change upon the fourth input, the output signal having a magnitude responsive to the third input and having a first polarity if the first input is greater than the reference value and the second input has the first value, having a first polarity if the first input is less than the reference voltage and the second input has the second value, having a second polarity in other cases;

a filter with an input coupled to the output of said detector and an output coupled to the input of said variable oscillator for low pass filtering the signal thereto and producing an output representative of the low pass fltered input.

4,065,797

MULTI-ELEMENT MAGNETIC HEAD

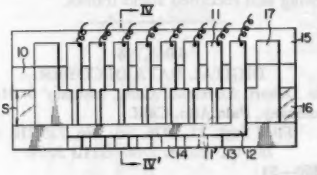
Noboru Nomura, Kyoto; Kenji Kanai, Neyagawa; Nobuyuki Kaminaka, Moriguchi, and Norimoto Nouchi, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 16, 1975, Ser. No. 641,224

Claims priority, application Japan, Dec. 20, 1974, 49-147384; Dec. 24, 1974, 49-2743; Dec. 24, 1974, 49-2742

Int. Cl.² G11B *5/12*

U.S. Cl. 360—113 **13 Claims**



1. A multi-element magnetic head for use with a recording medium comprising

a base composed of a ferromagnetic material, said base having a groove in the surface thereof filled with a non-magnetic material and extending parallel to a face of said base adapted for contact with said recording medium; and

a plurality of magnetoresistive effect elements composed of a ferromagnetic material arranged on and bridging said groove, each said magnetoresistive effect element forming a magnetic circuit together with said ferromagnetic base, the resistance of said magnetoresistive effect element changing in accordance with an applied magnetic field.

4,065,798

CLEANING CARTRIDGE

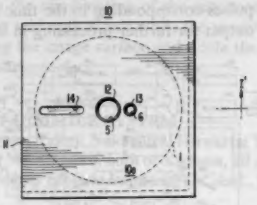
Tsutomu Sugisaki, and Hideomi Watanabe, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Aug. 26, 1976, Ser. No. 717,836

Claims priority, application Japan, Aug. 26, 1975, 50-117302[U]; Aug. 26, 1975, 50-117303[U]

Int. Cl.² G11B *5/41*

U.S. Cl. 360—128 **2 Claims**



1. A cartridge for cleaning magnetic heads for use with a flexible disc which comprises:

a cleaning disc comprising a flexible and non-magnetic support, a magnetic layer provided on both surfaces of the flexible and non-magnetic support, and a fibrous material layer for contact with the magnetic head for cleaning thereof provided on one layer of the magnetic layers; and a flat box-like cartridge with a lubricant layer provided on the inner surface of the flat box-like cartridge which faces the exposed magnetic layer of the cleaning disc, which flat box-like cartridge rotatably accomodates the cleaning disc.

4,065,799

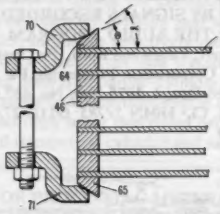
MEANS AND METHOD FOR CLAMPING A DISK PACK

Steven L. Kaczeus, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Feb. 2, 1976, Ser. No. 654,196

Int. Cl.² G11B *25/04*

U.S. Cl. 360—135 **21 Claims**



9. In a magnetic disk subsystem of the type including a stack of axially aligned magnetic disks having concentric apertures therein, a spindle for rotatably supporting the stack, and an access mechanism having transducers adapted to be electromagnetically coupled to ones of the disks, means for applying axial pressure to the stack, comprising:

a clamping hub having a peripheral surface whose diameter is greater than the diameter of the apertures in the disks, said peripheral surface overlying the uppermost one of the disks;

a clamping ring disposed between said clamping hub and the end one of the disks and having a lower surface substantially parallel with the upper surface of said disk and an upper surface extending at an angle α to the upper surface of said disk; and

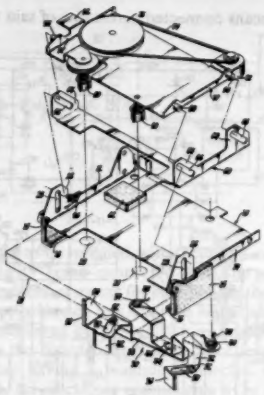
tensioning means for drawing said clamping hub and clamping ring against said disk to axially compress said stack, the interaction of said angled upper surface of said clamping ring and said peripheral surface of said hub being such that dishing of the endmost disk is substantially eliminated.

4,065,800

TAPE CASSETTE PLAYER

James R. Wilson, Kokomo, and Jerry P. Wise, Peru, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 16, 1977, Ser. No. 777,964
Int. Cl.[2] G11B *15/24*
U.S. Cl. 360—137 **4 Claims**



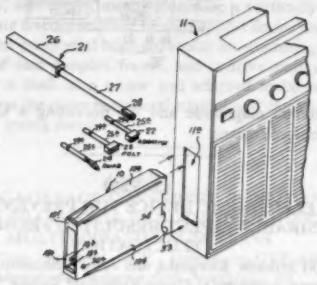
1. A tape cassette player comprising, a base member having guide means defining a chamber having an axis for slidably receiving a tape cassette movable along the axis, a tape transport assembly including tape drive means, means supporting said tape transport assembly for movement perpendicular to the said axis between a tape drive position wherein said tape drive means projects into said chamber for driving engagement with said tape cassette and an inoperative position spaced from said tape cassette, spring means for biasing said tape transport assembly to said tape driving position, a manually operable eject slide supported for movement by said base member, said eject slide being operatively connected to move said tape transport assembly from said tape driving position to said inoperative position against the force of said spring means, a lever assembly comprising a pair of levers pivotally supported by said base member, the levers including cassette engaging contact elements disposed in said chamber, and coupling means interconnecting the levers to maintain the contact elements in a plane perpendicular to the said axis, resilient means connected to the lever assembly for urging said levers and said contact elements toward a first state in engagement with said cassette when said cassette is partially inserted into said chamber, said levers and contact elements being moved by engagement with said cassette against the force of the resilient means to a second state upon the complete insertion of said cassette into said chamber, abutment means carried by said lever assembly and engageable with said tape transport assembly for holding the tape transport assembly in said inoperative position when said levers are in said first state, said abutment means being disengaged from said tape transport assembly when said levers are moved to said second state whereby the tape transport assembly is moved to the said tape driving position.by said spring means when a cassette is completely inserted into the chamber, and means on the tape transport assembly operative in the tape driving position for maintaining the levers in the second state, the lever assembly being released to move the said levers to the said fist state by the force of the resilient means when the tape transport assembly is moved to said inoperative position by operation of the eject slide whereby the cassette is forcibly ejected from said chamber.

4,065,801

KIT FOR CLEANING TAPE CARTRIDGE PLAYBACK UNIT

Raymond C. Leaming, 721 S. Washington, Liberal, Kans. 67901

Filed Aug. 29, 1975, Ser. No. 609,009
Int. Cl.[2] G11B *5/41*
U.S. Cl. 360—137 **10 Claims**



1. A kit for cleaning the components of a cartridge tape playback unit having a rotating drive capstan and an opening for receiving a cartridge enclosed tape, comprising:

a. a hollow cartridge case having side walls and a substantially completely open front end for providing unobstructed viewing of said components, to determine whether or not any of said components require cleaning, when said cartridge is inserted in said cartridge receiving opening;

b. separate, non-affixed tool holder means for mounting at least one cleaning head for cleaning at least one of said components when said viewing determines that cleaning is required; and

c. access means in the rear end of said cartridge for permitting said tool to pass through said cartridge from said open front end and selectively engage said at least one of said components.

4,065,802

INVERTER CIRCUIT FOR INDUCTION HEATING COOKING OVENS WITH A PROTECTION DEVICE

Takumi Mizukawa, Neyagawa; Masatatsu Nakamura, Higashimikunimachi; Kouzi Funakoshi, Osaka, and Hideyuki Kominami, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 27, 1976, Ser. No. 661,991
Claims priority, application Japan, Mar. 7, 1975, 50-28530
Int. Cl.[2] H02H *7/122*
U.S. Cl. 361—18 **6 Claims**

1. An inverter circuit for energizing an induction heating cooking oven from a power supply having a circuit breaker connected thereto comprising

a heating coil for generating an A.C. magnetic field;

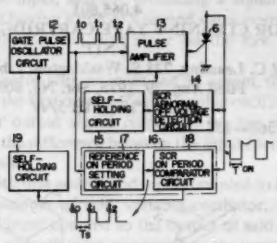
a thyristor inverter coupled to said power supply for supplying A.C. power to said heating coil;

control means for controlling said thyristor inverter; and

protection means for said thyristor inverter connected to said control means including,

thyristor conduction period detection means for detecting that the conduction period of said thyristor inverter exceeds a predetermined time period and for generating a signal to be applied to said control means thereby stopping operation of said thyristor inverter without actuating said circuit breaker, and

voltage detection means for detecting that the voltage applied to said thyristor inverter differs from a predetermined magnitude and for providing a signal to said control means.



4,065,803

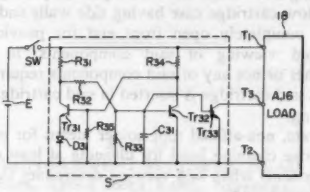
ELECTRONIC DEVICE FOR PREVENTING UNDESIRABLE EFFECT RESULTING FROM VOLTAGE FLUCTUATION

Hiroyuki Mikada, Kawasaki, and Jyuji Kishimoto, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1975, Ser. No. 638,802

Int. Cl.² H02H *3/24*

U.S. Cl. 361—88 **6 Claims**



1. An electronic device comprising:

detection means for coupling to a first voltage source to determine when a voltage applied from the source is outside of a predetermined range and for producing a corresponding detection signal;

means coupled to said detection means for producing a cutoff signal in response to the detection signal from said detection means;

voltage conversion means for coupling to the voltage source for supplying a second voltage for use in said device; and

disable means coupled to said cutoff signal means and said voltage conversion means for disabling said conversion means in response to the occurrence of said signal, wherein said disable means has a hysteresis characteristic such that said voltage conversion means is enabled when the voltage applied to said device is greater than a selected value, and said conversion means is disabled when the source voltage decreases a predetermined amount below said selected value.

4,065,804

ELECTRONIC CONTROL SYSTEM FOR MOTORS AND THE LIKE

Rolf A. Rostad, 330 College Ave., Angwin, Calif. 94508

Division of Ser. No. 492,491, July 29, 1974, abandoned, and a continuation of Ser. No. 357,863, May 7, 1973, abandoned. This application May 21, 1975, Ser. No. 579,526

Int. Cl.² H02H *3/10*

U.S. Cl. 361—96 **3 Claims**

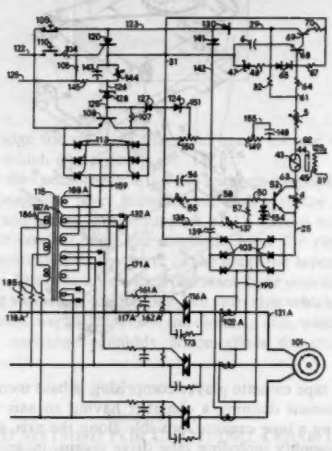
1. A multi-level trip circuit for electrical loads having high unit current demands when they are connected to an electrical source for applying energy thereto comprising:

electrical connection means for connecting a load to an electrical source, said electrical connection means including a controllable switch means for connecting and disconnecting said load to said electrical source;

current sensing means associated with said electrical connection means operable to develop an electrical signal proportional to the instantaneous current passing through said electrical connection means;

circuit means connected to receive said signal for said sensing means, said circuit means having at least a first resistance and a second resistance connected in series, arranged so said electrical signal passes serially therethrough;

switching means connected across one of said first and second resistances operable to bypass one of said resistances when said switching means electrically conducts;



a timing circuit connected to receive said electrical signal and connected to said switching means being operable to activate said switching means to bypass the resistance across which it is connected at a preselected time interval based on the level of said electrical signal; and

a control means connected to the output of said circuit means and to said controllable switch means operable to cause said switch means to dissconnect said load from said electrical source when said electrical signal exceeds predetermined levels whereby a higher initial current can be drawn by said load for a preselected time interval without causing said switch means to disconnect the load and thereafter a lower current level will cause the switch means to disconnect the load after the preselected time interval has been exceeded.

4,065,805

CIRCUIT ARRANGEMENT IN AN ELECTRICAL DEVICE OPERATED WITH DIRECT-CURRENT, ESPECIALLY IN A TIMING RELAY

Heinz Unterweger, Aarau, and Maurice Grémaud, Buchs, both of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed Apr. 12, 1976, Ser. No. 675,942

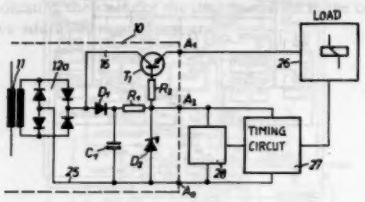
Claims priority, application Switzerland, Apr. 16, 1975, 4873/75

Int. Cl.² H01H *47/18*

U.S. Cl. 361—196 **8 Claims**

1. A circuit arrangement in an electrical device containing a load which can be supplied with a direct-current voltage of lesser quality and electronic components which can be sup-

plied with a direct-current voltage of greater quality, especially in a timing relay, for supplying the device with energy from an alternating-current network by means of voltage transforming means which can be connected with the alternating-current network and a rectifier arrangement connected in circuit thereafter, the improvement comprising: the rectifier arrangement having an output, a first supply branch connected in circuit with said output, a second supply branch connected in circuit with said output, said second supply branch including smoothing means and voltage stabilizer means, reverse current-blocking means for connecting said second supply branch with said output, the load which is to be supplied with the direct-current voltage of lesser quality being connected with the first supply branch and the electronic compo-



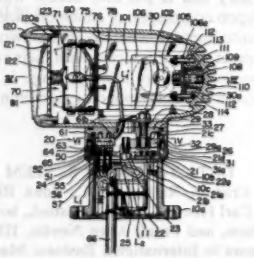
nents which are to be supplied with the direct-current voltage of greater quality being connected with the second supply branch, voltage limiter means for maintaining the voltage peak in the first supply branch less than the amplitude of the rectified voltage delivered by the rectifier arrangement, the load supplied with the direct-current voltage of lesser quality including a relay having a winding connected with the first supply branch, the electronic components to be supplied with the direct-current voltage of greater quality comprising a timing circuit, bistable flip-flop stage provided for the timing circuit, circuit means for determining the starting conditions for the bistable flip-flop stage, said timing circuit with the bistable flip-flop stage and said circuit means being connected in circuit with the second supply branch.

4,065,806

SEARCHLIGHT OR THE LIKE

Taiji Satoh, Koshigaya, Japan, assignor to Sanshin Dengu Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 534,183, Dec. 19, 1974, abandoned.
This application Aug. 27, 1976, Ser. No. 718,221
Claims priority, application Japan, June 28, 1974, 49-73264
Int. Cl.[2] F21M *3/18*; F21S *1/02*
U.S. Cl. 362—419 **2 Claims**



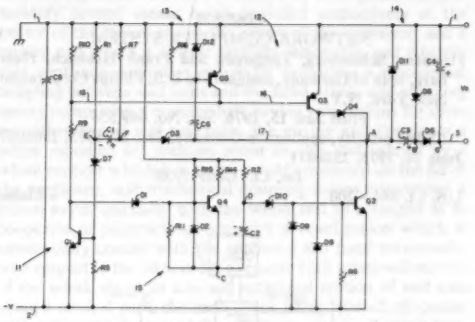
1. A searchlight comprising a base; a planetary rotation means mounted water-tightly on said base; and a housing mounted water-tightly on said planetary rotation means for horizontal rotation and having only at the front end an opening tightly closed by a front glass; said planetary rotation means including a motor accommodated within said base, a drive sun wheel firmly mounted on a shaft of said motor, a stationary planet ring fixedly secured to said base concentrically with said drive sun wheel, and at least one planetary wheel which is rotatably mounted on a stationary shaft secured to said housing and which is arranged between the drive sun wheel and the stationary planet ring in pressuring engagement therewith; said housing having therein a support frame of sheet metal pivotally supported on the inner wall thereof in a position adjacent the front glass for upward and downward tilting movement, said support frame carrying at least one lamp and reflector and having pivots lying on a horizontal axis passing through a focal point of said at least one reflector, and said housing also having therein a means for tilting said support frame upwardly and downwardly, said tilting means including a vertically pivotal elevation plate fixedly secured to the support frame and defining at its outer peripheral edge a circular arc centering around the pivots of said support frame, and a drive pulley firmly mounted on a shaft of a motor and adapted to be normally pressed against the outer peripheral edge of said elevation plate by means of spring force.

4,065,807

DC-TO-DC VOLTAGE CONVERTER EMPLOYING A COMMON TRANSISTOR IN BOTH SWITCHING AND MULTIVIBRATOR FUNCTIONS

Neale A. Zellmer, Belmont, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 7, 1977, Ser. No. 766,173
Int. Cl.[2] H02M *3/155*
U.S. Cl. 363—16 **8 Claims**



1. An inductorless dc-to-dc voltage converter for converting a dc input voltage of one polarity to a dc output voltage of the opposite polarity comprising:

an input port having a pair of terminals to which the dc input voltage of one polarity is to be applied;

an output port having a pair of terminals across which the dc output voltage of the opposite polarity is to be produced;

first means electrically connecting one terminals of said input and output ports together;

second means which is a regenerative switching means comprising first and second transistors which are free running and operating 180° out-of-phase;

third means which is a current switching means comprising said second transistor of said second (regenerative switching) means, a third transistor, and fourth means for electrically connecting the primary conduction paths of said third transistor and the common-second transistor in series across said input port, said second and third transistors also operating 180° out-of-phase with each other, being of opposite conductivity types, and have their emitter-collector junctions electrically connected in series across said input port; said third transistor being responsive to and controlled by the operation of said first transistor;

a first capacitor electrically connected across said output port;

a second capacitor;

a first diode;

fifth means electrically connecting said first diode and second capacitor in series in that order between the other output terminal and a common electrical connection point of said second and third transistors;

a second diode electrically connected between said one output terminal and the junction of said second capacitor and said first diode;

said first and second diodes being poled for only said second diode conducting through said second capacitor and said second transistor for charging said second capacitor in one direction during conduction of said second transistor; said first diode being cut off during this time interval of conduction of said second transistor for preventing said first capacitor discharging through the converter circuitry; and being poled for only said first diode conducting through said first capacitor, said third transistor, and said second capacitor for charging the latter during conduction of said third transistor for producing a relatively constant output voltage across said output port of the opposite polarity;

said fourth (connecting) means comprising a third diode in the electrical connection between said second and third transistors and also in the electrical connection between said second capacitor and said third transistor, said third diode being poled for isolating the emitter-collector junction of said third transistor from a pulse voltage of one polarity at the said second capacitor during nonconduction of said third transistor.

4,065,808

NETWORK COMPUTER SYSTEM

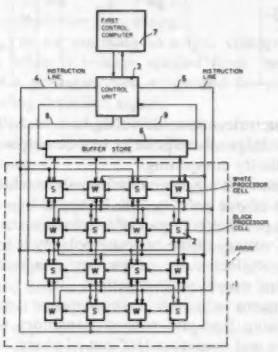
Hermann Schomberg, Tangstedt, and Frank Heubach, Hamburg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,556

Claims priority, application Germany, Jan. 25, 1975, 2503087; June 16, 1975, 2526811

Int. Cl.[2] G06F *7/38*

U.S. Cl. 364—200 **3 Claims**



1. A multiprocessor computer system comprising:

a control computer and a control unit connected thereto;

first and second groups of identical processors arranged in a matrix array, each of said processors of one group lying directly adjacent to at least two of said processors of the other group and connected to said adjacent processors by means of data exchange lines; each group of said processors being separately connected to said control unit by instruction lines and signalling lines for transmitting noncorresponding instructions from said control computer to each group of processors; and

a buffer store connected to said control unit by data lines and connected to at least some of said processors for storing information for processing by said at least some of said processors.

4,065,809

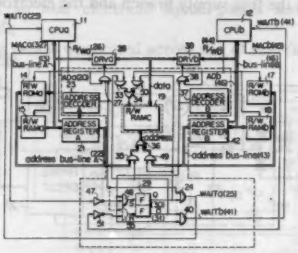
MULTI-PROCESSING SYSTEM FOR CONTROLLING MICROCOMPUTERS AND MEMORIES

Mitsuo Matsumoto, Kokubunji, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 27, 1976, Ser. No. 690,603

Int. Cl.[2] G06F *15/16, 13/00*

U.S. Cl. 364—200 **4 Claims**



1. A multi-processing system for controlling microcomputers and memories comprising

a plurality of microcomputers each provided with an exclusive memory which is put into access with a corresponding microcomputer whenever the microcomputer designates an address within a first range;

a plurality of common memories each connected to two of the microcomputers and put into access with either of the two microcomputers whenever either microcomputer designates an address within a second range;

a plurality of detector means, each including an address decoder to detect that the corresponding microcomputer designates an address within said second range, provided at every microcomputer for detecting whether or not the microcomputer designates the address of a corresponding common memory according to address data from the microcomputer; and

a plurality of control means each for controlling the access between every two microcomputers and the corresponding common memory based on detection outputs of corresponding detector means so that one of the two microcomputers is prohibited from being put into access even if designating the address of the common memory while the other microcomputer is in access with the common memory and is put into access with the common memory upon completion of a memory access cycle of the other microcomputer whereby every two microcomputers are separately put in access with their exclusive memories, respectively, if no data exchange is made between them through the corresponding common memory.

4,065,810

DATA TRANSFER SYSTEM

Clark Evans Cramer, Raleigh, N.C.; John Richard Gaetjen, Saugerties; Carl Henry Grant, Woodstock, both of N.Y.; Paul Eugene Nelson, and Frank Allen Newlin, III, both of Cary, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,686

Int. Cl.[2] G06F *3/00*

U.S. Cl. 364—200 **2 Claims**

1. An output channel system for transferring data blocks and control information stored in several different locations in a memory connected to a data processor to a device comprising:

at least two pointer registers in the data processor, a first of

which includes the address in memory of the first control information,

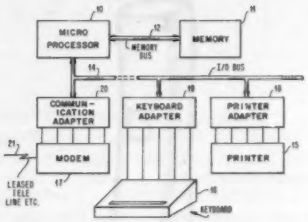
a control channel interconncting the pointer registers and the device,

a data channel interconnecting the memory and the device,

first means connected to the device for accessing the address stored in the first pointer register to cause the memory contents of that addressed location to be transmitted over the data channel to the device, the control information including:

the first address in memory containing data to be transmitted,

a count field indicating the number of consecutive addresses in memory having data to be transmitted and control bits indicating the status of the data contained in the consecutive addresses in memory; and



means for incrementing said first address in the first pointer register,

second means connected to the device for transferring the received first address to the second pointer register which includes means for initiating a write operation in the memory at the transferred address to cause the data stored at said first address to be transferred to the device via the data channel and means for incrementing the address inserted in the second pointer register after said data transfer and means for decrementing the count stored in the device after said data transfer, means for repeating the data trasfer sequence until the number stored in the count field is reduced to zero and means for thereafter repeating the entire sequence set forth above until all the control bits have been received, so as to indicate that all data has been transferred to the device.

4,065,811

DOMESTIC APPLIANCE FOR CONDITIONG FOOD SUCH AS SALADS

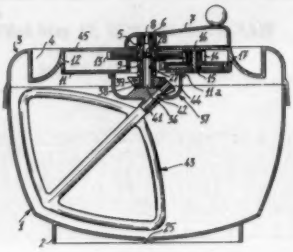
Bernard Pauty, Daix-Fontaine-les-Dijon, France, assignor to Seb S.A., Selongey, France

Filed Nov. 2, 1976, Ser. No. 738,178

Claims priority, application France, Nov. 25, 1975, 75.35953

Int. Cl.[2] B01F *7/30*

U.S. Cl. 366—244 **21 Claims**



1. A domestic appliance for conditioning food and especially food in the form of leaves such as salads, comprising a container fitted with a lid for carrying an actuating hand-crank on which is keyed a toothed ring, wherein said appliance comprises in combination a spin-drying unit composed of a removable drying basket driven in rotation by a lid-plate, complementary pivotal means being provided respectively at the center of the basket and at the center of the container, and a mixing unit which is at least partially removable, and wherein said appliance comprises means for providing a mechanical coupling between said units and the hand-crank, said coupling means comprising a countershaft having two pinions for driving either one of said two units, the mixing unit comprises a whisk mounted for rotation about its axis and carried by a whisk support which is in turn rotatably mounted on the lid of the appliance, said mechanical coupling means comprising a pinion keyed coaxially with the whisk and so arranged as to cooperate in planetary motion with a bevel pinion which is substantially coaxial with the appliance and fixed rotationally with respect to the lid in order to ensure both rotational motion of the whisk about its axis and rotational motion of said axis along a conical path, the hand-crank being located off-center with respect to the axis of the appliance, said hand-crank having a second toothed ring having a diameter which is different from the first, said toothed rings being so arranged as to engage with the pinions of the countershaft, said countershaft being substantially coaxial with the appliance, and the bevel pinion being permanently fixed on the lid of the appliance at least during normal operation.

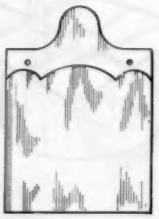
DESIGNS

DECEMBER 27, 1977

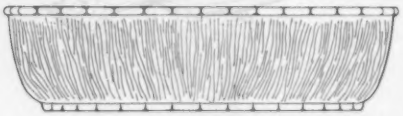
246,746
ROBE AND HOOD ENSEMBLE
Margaret L. Dyer, 2873 Amulet St., San Diego, Calif. 92123
Filed Dec. 24, 1975, Ser. No. 644,302
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—181

246,747
PARTS CLEANING BRUSH
Larry A. Brandt, Horace, N. Dak. 58047, and Bruce R. Johnson, Box 12, Hickson, N. Dak. 58044
Filed Feb. 23, 1976, Ser. No. 660,240
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—02

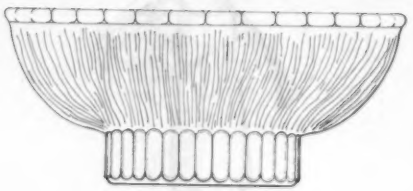
246,748
HOLDER FOR A TELEPHONE DIRECTORY
John R. Tricario, 312 Riva Ave., Milltown, N.J. 08850
Filed July 27, 1976, Ser. No. 708,709
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—131



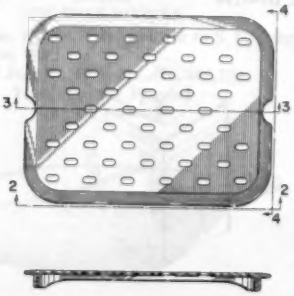
246,749
OVAL BOWL
Arthur L. Harshman, Dunkirk, Ind., and James I. Messmer, Detroit, Mich., assignors to Florists' Transworld Delivery Association
Filed May 17, 1976, Ser. No. 687,189
Term of patent 14 years
Int. Cl. D7—*01;* D11—*02*
U.S. Cl. D7—1



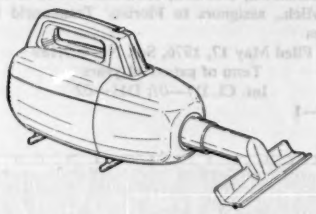
246,750
ROUND BOWL
Arthur L. Harshman, Dunkirk, Ind., and James I. Messmer, Detroit, Mich., assignors to Florists' Transworld Delivery Association
Filed May 17, 1976, Ser. No. 687,190
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—28



246,751
DRAIN TRAY FOR A FOOD SERVICE PAN
Ronald C. Yonkers, Winchester, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Mar. 15, 1976, Ser. No. 666,949
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—129

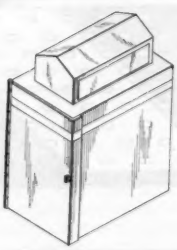


246,752
VACUUM CLEANER
Kiyoshi Fukuda, Fukuoka, and Daisuke Kajiwara, Ohnojo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed July 19, 1976, Ser. No. 706,407
Term of patent 14 years
Int. Cl. D7—*05*; D15—*05*
U.S. Cl. D7—164

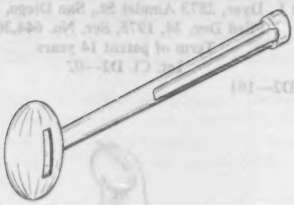


246,753
CHEWED GUM DISPOSAL RECEPTACLE
Charmaine A. Jenkins, P.O. Box 635, Burlington, Vt. 05401
Filed Oct. 6, 1975, Ser. No. 619,678
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—191

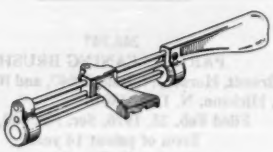
246,754
RUBBISH RECEPTACLE
Lawrence Klosk, 3977 Sedgwick Ave., Bronx, N.Y. 10463
Filed June 21, 1976, Ser. No. 698,208
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—194



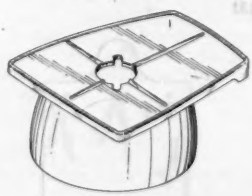
246,755
ICE HAMMER
James R. Root, 3412 Norton, Independence, Mo. 64052
Filed Apr. 26, 1976, Ser. No. 680,526
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—77



246,756
SAW SHARPENER OR THE LIKE
Norman Linfoot Smyth, and Roy George Hodgson, both of Sheffield, England, assignors to James Neill Holdings Limited, United Kingdom
Filed Sept. 17, 1976, Ser. No. 724,368
Claims priority, application United Kingdom, Apr. 20, 1976, 975350/76
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—91

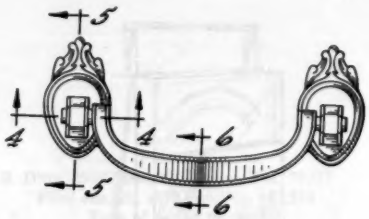


246,757
COMBINED DOOR PULL AND ESCUTCHEON
Russell W. Waldo, St. Paul, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.
Filed July 28, 1976, Ser. No. 709,434
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—301

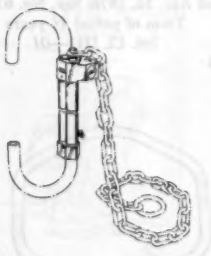


246,758
HANDLE GRIP FOR VEHICLE
Kiyoshi Ukai, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 1, 1976, Ser. No. 728,790
Claims priority, application Japan, Apr. 12, 1976, 51-13417
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D8—303

246,759
BAIL PULL
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 1, 1976, Ser. No. 746,608
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—306



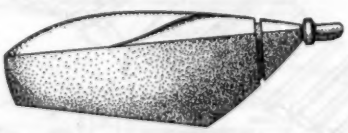
246,760
LOCKING DEVICE FOR VEHICLES
Henry Hart, 86 Manor Road, Chigwell, Essex, England
Filed May 14, 1976, Ser. No. 686,383
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—341



246,761
KEY BLANK
Craig B. Kelley, Cedar Grove, N.J., and David C. Cole, Bristol, Conn., assignors to Emhart Industries, Inc.
Filed June 7, 1976, Ser. No. 690,381
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—347

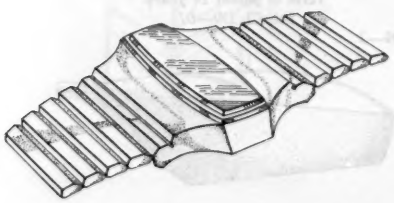
246,762
UTILITY POLE ADJUSTABLE INSULATOR BRACKET
Joseph W. Dimiceli, and Edgardo R. Labra, both of 530 S. 11th St., Richmond, Calif. 94801
Filed Apr. 5, 1976, Ser. No. 673,401
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—364

246,763
SQUEEZE BOTTLE
Warren J. Luedtke, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed June 11, 1976, Ser. No. 695,239
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—2



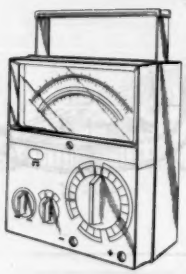
246,764
BOTTLE
John Paul Veasy, Alameda, Calif., assignor to Owens-Illinois, Inc.
Filed Dec. 18, 1975, Ser. No. 642,081
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—137

246,765
DIGITAL WRIST WATCH
Eugene Joseph Sulek, Richardson, Tex., assignor to Texas Instruments Incorporated
Continuation-in-part of Ser. No. 501,549, Aug. 29, 1974, Pat. No. D. 238,759. This application Sept. 11, 1975, Ser. No. 612,617
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



246,766
INFRARED THERMOMETER
Charles E. Everest, Santa Ana, Calif., assignor to Telatemp Corporation, Fullerton, Calif.
Filed Oct. 15, 1975, Ser. No. 622,669
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

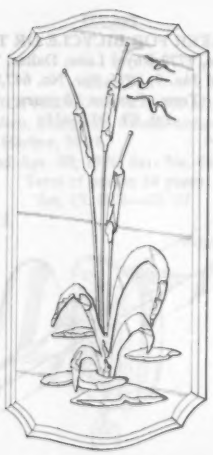
246,767
ELECTRICAL MEASURING INSTRUMENT
Robert John Needham, 34 Grosvenor Road, Chiswick, London, W. 4., England
Filed May 14, 1976, Ser. No. 686,639
Claims priority, application United Kingdom, Nov. 18, 1975, 973279/75
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78



246,768
BRACELET
Pepi G. Kelman, 19264 Pacific Coast Highway, Malibu, Calif. 90265
Filed Apr. 16, 1976, Ser. No. 677,550
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4

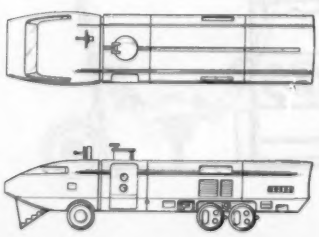
246,769
TIE CLIP
Raymond Kozak, 833 N. New St., Bethlehem, Pa. 18018
Continuation-in-part of Ser. No. 553,578, Feb. 27, 1975, abandoned. This application Oct. 21, 1976, Ser. No. 734,675
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—48

246,770
PLAQUE
Donald R. Ditto, 4938 Sharp St., Dallas, Tex. 75247
Filed Jan. 26, 1976, Ser. No. 652,554
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—139

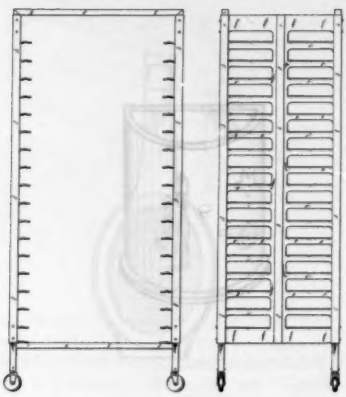


246,771
FLOWER POT
Genniel Daniels, 122 Ludlow St., New York, N.Y. 10002
Filed Feb. 19, 1976, Ser. No. 659,283
Term of patent 3½ years
Int. Cl. D11—*02*
U.S. Cl. D11—143

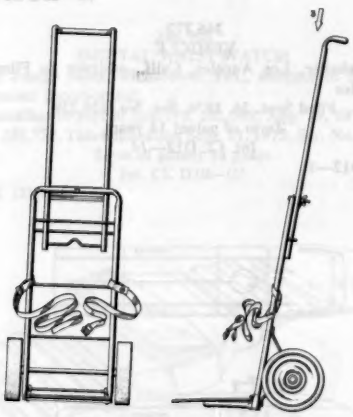
246,772
VEHICLE
Curtis Brubaker, Los Angeles, Calif., assignor to Filmation Associates
Filed Sept. 24, 1976, Ser. No. 726,239
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—1



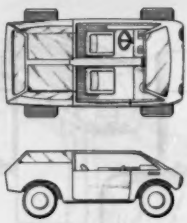
246,773
TRAY RACK
Robert F. Bladis, 2 High Point Drive, Mountainside, N.J. 07092
Filed Nov. 11, 1976, Ser. No. 741,146
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—22



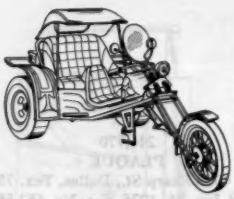
246,774
HAND TRUCK
Patsy Esposito, 350 Clarkson Ave., Brooklyn, N.Y. 11226
Filed Apr. 23, 1976, Ser. No. 679,849
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—34



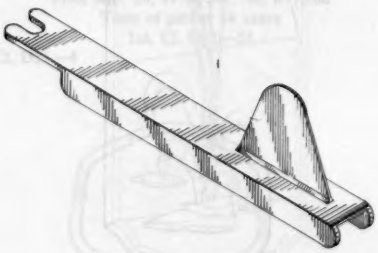
246,775
VEHICLE
Curtis Brubaker, Los Angeles, Calif., assignor to Filmation Associates
Filed Sept. 24, 1976, Ser. No. 726,240
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—90



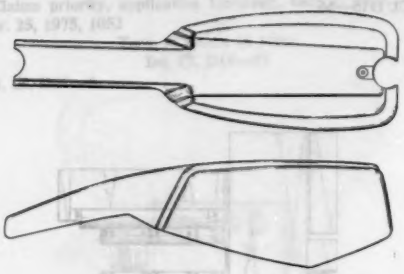
246,776
MOTORIZED TRICYCLE
Michael C. Moore, 3619 National Ave., San Diego, Calif. 92113
Filed Oct. 20, 1976, Ser. No. 734,378
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110



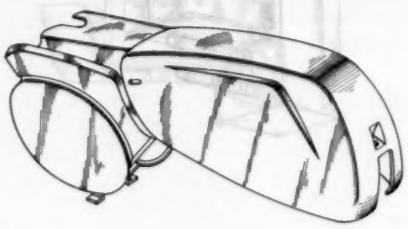
246,777
NOISEMAKER FOR BICYCLE OR THE LIKE
James T. Rutledge, 7779 Royal Lane, Dallas, Tex. 75230
Filed Jan. 9, 1976, Ser. No. 647,878
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



246,778
BICYCLE TANK
Larry M. Cognata, Nashville, Tenn., assignor to The Murray Ohio Manufacturing Co.
Filed May 18, 1976, Ser. No. 687,508
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—126

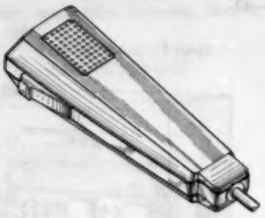


246,779
BICYCLE TANK
Larry M. Cognata, Nashville, Tenn., assignor to The Murray Ohio Manufacturing Co.
Filed July 26, 1976, Ser. No. 708,422
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—126



246,780
MICROPHONE/ENCODER MODULE
Richard W. Renken, Bridgman, Mich., assignor to Heath Company, Benton Harbor, Mich.
Filed Apr. 30, 1976, Ser. No. 681,879
Term of patent 14 years
Int. Cl. D14—*03, 01*
U.S. Cl. D14—12

246,781
MICROPHONE OR SIMILAR ARTICLE
Rudolph William Krolopp, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed June 25, 1976, Ser. No. 699,918
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12



246,782
STETHOSCOPE HEADSET
Robert F. Saiya, N. Babylon, N.Y., assignor to Instrument Systems Corporation, Huntington, N.Y.
Filed Dec. 20, 1976, Ser. No. 752,358
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—36

246,783

DATA-COLLECTION APPARATUS

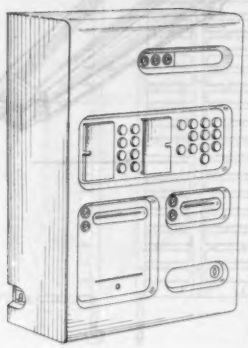
Tommy R. Hardy, Boca Raton, Fla., and Collan B. Kneale, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,087

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—40



246,784

TELEPHONE SET

Hisao Fukushima; Katsuhito Watanabe, and Tsutomu Watanabe, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1976, Ser. No. 735,636

Claims priority, application Japan, June 7, 1976, 51-21072

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—53

246,785

WINDER FOR SYNTHETIC FILAMENT YARNS

Isamu Abe, and Takami Sugioka, both of Matsuyama, Japan, assignors to Teijin Limited and Teijin Seiki Co., Ltd., both of Osaka, Japan

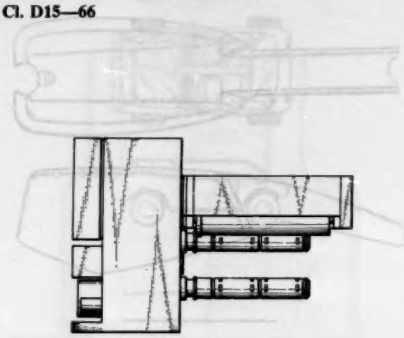
Filed Mar. 17, 1976, Ser. No. 667,680

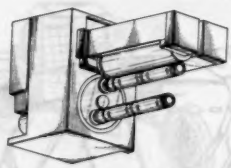
Claims priority, application Japan, Sept. 27, 1975, 50-39154

Term of patent 14 years

Int. Cl. D15—*06*

U.S. Cl. D15—66





246,786

MOTION PICTURE CAMERA

Kurt Bode, Braunschweig, and Jochen Kramer, Wolfsburg, both of Germany, assignors to Rollei-Werke Franke & Heidecke, Germany

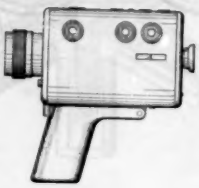
Division of Ser. No. 614,832, Sept. 19, 1975, Pat. No. Des. 242,617, which is a continuation-in-part of Ser. No. 455,868, March 28, 1974, abandoned. This application Dec. 29, 1975, Ser. No. 644,511

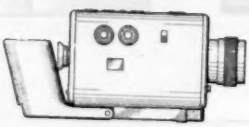
Claims priority, application Germany, Oct. 1, 1973, 1015; Mar. 25, 1975, 1052

Term of patent 14 years

Int. Cl. D16—*01*

U.S. Cl. D16—4





246,787

MOTION PICTURE CAMERA

Kurt Bode, Braunschweig, and Jochen Kramer, Wolfsburg, both of Germany, assignors to Rollei-Werke Franke & Heidecke, Germany

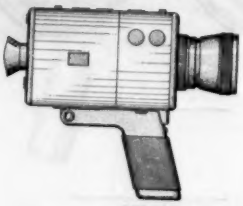
Division of Ser. No. 614,832, Sept. 19, 1975, Pat. No. Des. 242,617, which is a continuation-in-part of Ser. No. 455,868, March 28, 1974, abandoned. This application Dec. 29, 1975, Ser. No. 644,512

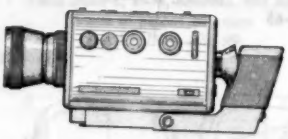
Claims priority, application Germany, Oct. 1, 1973, 1015; Mar. 25, 1975, 1052

Term of patent 14 years

Int. Cl. D16—*01*

U.S. Cl. D16—04





246,788

STEREOSCOPIC VIEWER

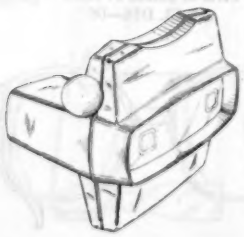
Robert M. Simonelli, Palatine, Ill.; Paul D. Miller, New York, and V. Lorenzo Porcelli, Ossining, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Nov. 13, 1975, Ser. No. 631,631

Term of patent 14 years

Int. Cl. D16—*06*

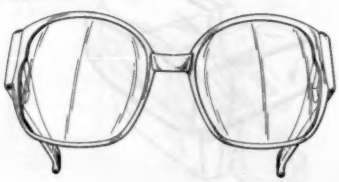
U.S. Cl. D16—12



246,789
PAIR OF SPECTACLES
Vitalino Marchi, Concord, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed Feb. 2, 1977, Ser. No. 766,119
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

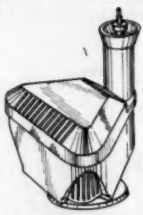
246,790
PAIR OF SPECTACLES
Larry G. Loughner, 6 Carisbrooke St., Andover, Mass. 01810
Filed Feb. 17, 1977, Ser. No. 769,767
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

246,791
PAIR OF SPECTACLES
Anthony Shindler, 54 Marshall St., Brookline, Mass. 02186
Filed Feb. 17, 1977, Ser. No. 769,765
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

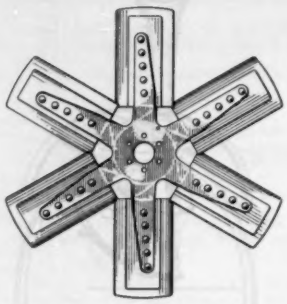


246,792
PAIR OF SPECTACLES
Larry G. Loughner, Andover, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 17, 1977, Ser. No. 769,768
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

246,793
AQUARIUM FILTER
Marvin A. Goldman, Great Neck; Jerome N. Goldman, New York; Silvio J. DiMarchi, and Barbara A. Mesquida, both of Brooklyn, all of N.Y., assignors to Penn-Plax Plastics, Inc., Garden City, N.Y.
Filed Sept. 30, 1976, Ser. No. 728,391
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

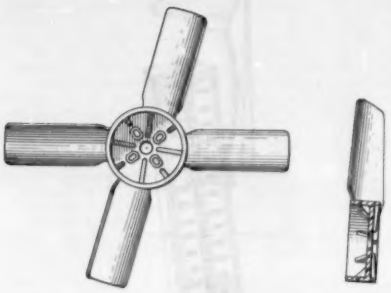


246,794
FAN FOR INTERNAL COMBUSTION ENGINES
Bern M. Bonifant, Tacoma, Wash., assignor to Flex-a-lite Corporation, Tacoma, Wash.
Filed Apr. 2, 1976, Ser. No. 673,122
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—165

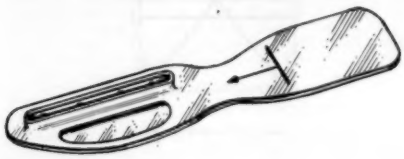


246,795
FAN BLADE
Bern M. Bonifant, Tacoma, Wash., assignor to Flex-a-lite Corporation, Tacoma, Wash.
Filed Apr. 2, 1976, Ser. No. 673,123
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—165

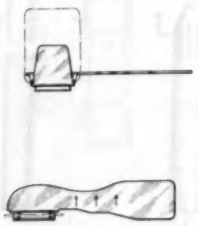
246,796
RADIATOR COOLING FAN
Stephen A. Laymon, Indianapolis, and Cheng-Chien Chou, Carmel, both of Ind., assignors to Wallace Murray Corporation, New York, N.Y.
Filed Oct. 27, 1976, Ser. No. 736,145
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—165



246,797
BITE-WING DENTAL X-RAY FILM HOLDER
Arthur C. Jermyn, 99 Whitestone Lane, Rochester, N.Y. 14618
Filed June 1, 1976, Ser. No. 691,312
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—02

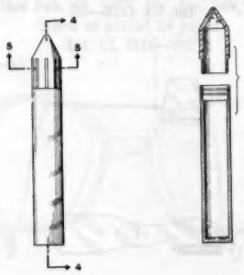


246,798
PERIAPICAL EXPOSURE DENTAL X-RAY FILM HOLDER
Arthur Charles Jermyn, 99 Whitestone Lane, Rochester, N.Y. 14618
Filed Dec. 20, 1976, Ser. No. 752,395
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—2

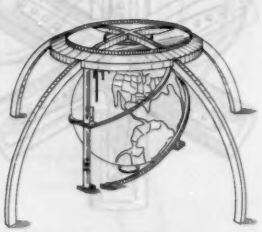


246,799
SPHYGMOMANOMETER
Donald H. Peeler, Henderson, N.C., assignor to Sybron Corporation
Filed Aug. 27, 1975, Ser. No. 608,086
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—21

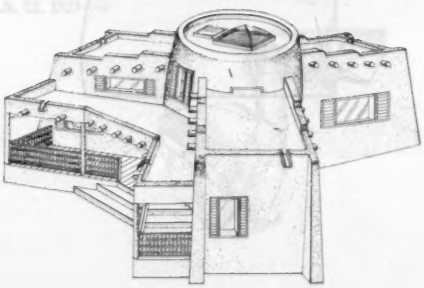
246,800
VIAL
Johnson N. S. Wong, 2910 Palos Verdes Drive, Rolling Hills, Calif. 90274
Filed Oct. 20, 1975, Ser. No. 623,833
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—56



246,801
COMBINATION CELESTIAL DISPLAY AND RESTAURANT BUILDING
John S. Alden, 808 W. Cuyler St., Chicago, Ill. 60613
Filed Sept. 2, 1975, Ser. No. 609,543
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—7



246,802
HOUSE
Ralph Mondragon, P.O. Box 199, Ranches of Taos, N. Mex. 87557
Filed Mar. 25, 1976, Ser. No. 670,255
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—19



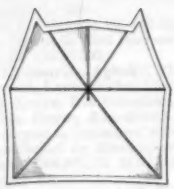
246,803
CIGARETTE AND CIGAR HOLDER
Mack Steinberg, 41 E. 20th St., New York, N.Y. 10003
Filed July 2, 1976, Ser. No. 702,181
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—02

246,804
APPLICATOR FOR SUNTAN LOTIONS AND OTHER LIQUIDS
Gerry Donald Kesler, 4920 Ballard, Lansing, Mich. 48910
Filed Oct. 29, 1976, Ser. No. 736,992
Term of patent 14 years
Int. Cl. D28—*99*; D4—*02*; D8—*05*
U.S. Cl. D28—7

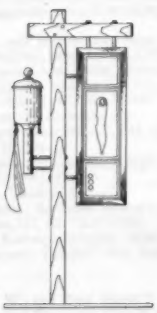
246,805
AIR CUSHION GAME TABLE
Joseph H. Gruenhut, Highland Park, Ill., assignor to Brunswick Corporation, Skokie, Ill.
Filed Jan. 8, 1976, Ser. No. 647,639
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 BB

246,806
HANDLE FOR SKI POLE OR THE LIKE
William Iezzi, 3328 Rhawn St., Philadelphia, Pa. 19136
Filed Mar. 29, 1976, Ser. No. 671,051
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

246,807
KITE
Aaron C. Moore, 20103 S. Radlett Ave., Carson, Calif. 90746
Filed Apr. 20, 1976, Ser. No. 678,476
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AF



246,808
COMBINED FAIRWAY MAP, YARD MARKER AND BALL WASHER FOR A GOLF COURSE
Peter J. Genova, P.O. Box 309, Oakdale, Calif. 95361
Filed June 11, 1976, Ser. No. 695,075
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

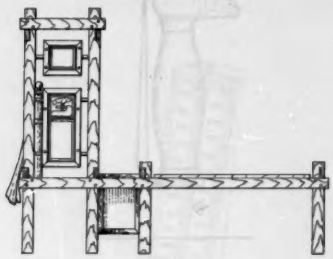


246,809

COMBINED FAIRWAY MAP, YARD MARKER, BALL WASHER AND REFUSE RECEIVER AND BENCH FOR A GOLF COURSE

Peter J. Genova, P.O. Box 309, Oakdale, Calif. 95361

Filed June 11, 1976, Ser. No. 695,269
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

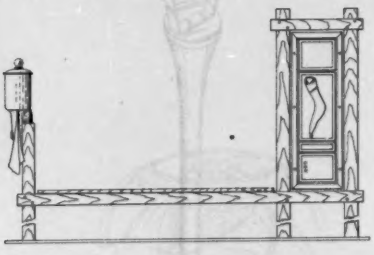


246,810

COMBINED FAIRWAY MAP, YARD MARKER, REFUSE RECEIVER, BENCH AND BALL WASHER FOR A GOLF COURSE

Peter J. Genova, P.O. Box 309, Oakdale, Calif. 95361

Filed June 11, 1976, Ser. No. 695,270
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF DECEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See*—
Sund, Joseph T., 4,064,834, Cl. 118-646.000.

Aas, Flemming: *See*—
Jeppesen, Borge; and Aas, Flemming, 4,064,609, Cl. 29-235.000.

AB Bofors: *See*—
Brandstrom, Karl Ivar, 4,064,731, Cl. 72-419.000.
Dahlberg, Stig Erland; and Gellerstedt, Nils Goran Axel, 4,064,805, Cl. 102-35.000.
Eklund, John Folke; and Svensson, Sven-Hakan, 4,064,787, Cl. 89-34.000.
Elwin, Tore, 4,064,786, Cl. 89-33.00B.

AB Svenska Flaktfabriken: *See*—
Lindgren, Stig Rune, 4,064,637, Cl. 34-122.000.

Abe, Fumiyuki; Ikawa, Kazuo; Ehama, Mituo; and Ogawa, Naoki, to Nissan Motor Co., Ltd. Knee protector. 4,065,157, Cl. 280-751.000.

Abe, Takemi: *See*—
Iwai, Naoji; Uchida, Takashi; and Abe, Takemi, 4,065,625, Cl. 428-596.000.

Aberg, Sven Ulrik Torbjorn; and Bergdahl, Sven Gunnar, to Molnlycke AB. Method of producing fluffed pulp. 4,065,347, Cl. 162-26.000.

Abrahamsson, Axel B.: *See*—
Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., 4,065,222, Cl. 407-18.000.

Acda, Petrus Marinus; and Karreman, Jacob, to Polva Nederland B.V. Apparatus for forming a thickened bell end on thermoplastic pipe. 4,065,243, Cl. 425-393.000.

Achelpohl, Fritz; and Schmedding, Herbert, to Windmoller & Holscher. Multi-layer bag open at one side. 4,065,049, Cl. 229-55.000.

Ackerman, Maria Elena Perdomo. Automatic bypass coffee brewer. 4,064,795, Cl. 99-304.000.

Acme-Cleveland Corporation: *See*—
Naegele, Robert, 4,064,926, Cl. 164-154.000.

Adams, Edward C.: *See*—
Meier, Michael J.; Adams, Edward C.; and Lindberg, Richard W., 4,065,788, Cl. 358-166.000.

Adams-Russell Co., Inc.: *See*—
Seavey, John M., 4,065,772, Cl. 343-786.000.

Adams, Ted, to Parker-Hannifin Corporation. Hydraulic actuator. 4,065,094, Cl. 251-26.000.

Adcock, Willis A.; and Skaggs, Frank L., to Texas Instruments Incorporated. Single sensor time encoded color imaging system. 4,065,785, Cl. 358-44.000.

Addressograph Multigraph Corporation: *See*—
Schweitzer, Roy C., 4,064,804, Cl. 101-451.000.

Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Thermoplastic polycarbonate moulding compositions with improved ease of mould release. 4,065,436, Cl. 260-47.0XA.

Adler, Robert B. Drill tip and threaded fastener. 4,064,784, Cl. 85-41.000.

Advanced Instrument Development, Inc.: *See*—
Fiocca, Louis L., 4,065,673, Cl. 250-402.000.

AGFA-Gevaert, A.G.: *See*—
Weyde, Edith; von Konig, Anita; and Liebe, Werner, 4,065,312, Cl. 96-50.00R.

AGFA-GEVAERT N.V.: *See*—
Laridon, Urbain Leopold; Delzenne, Gerard Albert; Mader, Helmut; Ulrich, Hans; and Seidel, Bernhard, 4,065,524, Cl. 260-895.000.

Aglitsky, Vladimir Efimovich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Lurie, Mikhail Vladimirovich; Topolyansky, Jury Arnoldovich; Kantor, Ilya Solomonovich; Chizhikov, Anatoly Petrovich; and Gun, Dmitry Rudolfovich, 4,065,076, Cl. 243-38.000.

Agrawal, Arun K.: *See*—
Hou, Shou L.; Dague, Leonard P.; and Agrawal, Arun K., 4,065,775, Cl. 346-140.00R.

Ahlgren, David William, to Jeno F. Paulucci. Method of cooking an item of food, using a food sheet and an open bottomed pan. 4,065,583, Cl. 426-243.000.

Air Products and Chemicals, Inc.: *See*—
Collins, Jr.; Watson R.; and Kokinda, James J., 4,064,890, Cl. 137-73.000.
Newton, Charles L.; and Gaumer, Lee S., 4,065,278, Cl. 62-26.000.

Airco, Inc.: *See*—
Timin, Mitchell E., 4,065,097, Cl. 251-228.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Sawada, Toshio; Yamamoto, Kimihiko; and Ishikawa, Hitoshi, 4,064,817, Cl. 112-158.00F.

Ajami, Alfred M.; Walsh, Fraser M.; and Crouse, Dennis N., to Eco-Control, Inc. Two phase electrolytes used as halogen traps in metal halogen secondary cells and batteries. 4,065,601, Cl. 429-50.000.

Ajdukovic, Djordje: *See*—
Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Schrenk, Heinrich Maria, 4,065,570, Cl. 424-273.00R.
Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Schrenk, Heinrich Maria, 4,065,571, Cl. 424-273.00R.

Akamatsu, Keiji, to Roland Corporation. Circuit for preferentially selecting highest and lowest tones. 4,064,777, Cl. 84-1.030.

Akashi Factory, Kawasaki Heavy Industries, Ltd.: *See*—
Nakaya, Akira; and Maruyama, Haruyoshi, 4,065,276, Cl. 55-276.000.

Akiyama, Masaharu: *See*—
Kawaguchi, Yoshihiko; Harada, Yoshimi; Miki, Makoto; Gouda, Kanenari; Akiyama, Masaharu; Tokura, Masayuki; and Kuroha, Jun, 4,065,419, Cl. 260-28.50D.

Akiyama, Takashi; Tanji, Akinori; Ikeda, Hideo; and Asano, Seiichi, to Toyobo Co., Ltd. Method for producing non-woven webs. 4,064,605, Cl. 28-103.000.

Aktay, Ali I.; Bodnaruk, Bohdan J.; and Holowaty, Michael O., to Inland Steel Company. Apparatus and method for separating a mixture of liquid and coal fines. 4,065,385, Cl. 210-44.000.

Aktieselskabet Grindstedvaerket: *See*—
Ross-Petersen, Karl Jakob, 4,065,461, Cl. 260-296.0AE.

Akzona Incorporated: *See*—
Beck, Heinz; Gabriel, Gerhard; and Poppel, Gunter, 4,065,608, Cl. 526-49.000.

Alan I W Frank Corporation, The: *See*—
Frank, Alan I W, 4,065,244, Cl. 425-412.000.
Schaeffer, Paul R., 4,065,530, Cl. 264-41.000.
Schaeffer, Paul R., 4,065,531, Cl. 264-41.000.

Alan Wood Steel Company: *See*—
Semel, Frederick J., 4,065,331, Cl. 148-36.000.

Albrecht, David E. Hydraulic fluid reservoir for a closed hydraulic system. 4,064,911, Cl. 138-30.000.

Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Lurie, Mikhail Vladimirovich; Topolyansky, Jury Arnoldovich; Kantor, Ilya Solomonovich; Chizhikov, Anatoly Petrovich; and Gun, Dmitry Rudolfovich. Pipeline for pneumatic transportation of cargoes in containers. 4,065,076, Cl. 243-38.000.

Alfred Gutmann Gesellschaft fur Maschinenbau: *See*—
Zeidler, Johannes, 4,064,656, Cl. 51-426.000.

Alfred Herbert Limited: *See*—
O'Brien, Rory Morgan, 4,065,716, Cl. 324-96.000.

Algard Pty. Ltd.: *See*—
Rigby, Robert Alexander, 4,065,386, Cl. 210-60.000.

Alison, Dave R. Kite reel system. 4,065,080, Cl. 244-155.00A.

Allan, Roy Duncan: *See*—
Johnson, James Edward; Foster, Tom; and Allan, Roy Duncan, 4,064,692, Cl. 60-261.000.

Allied Chemical Corporation: *See*—
Hasegawa, Ryusuke, 4,064,757, Cl. 73-362.0AR.

Allis-Chalmers Corporation: *See*—
Heian, Glenn A.; and Kohl, Robert F., 4,065,320, Cl. 106-100.000.

Allison, Kenneth C. Electrical connector. 4,065,637, Cl. 174-87.000.

Allison, William D. Multivane windmill. 4,065,225, Cl. 416-121.000.

Allmanna Svenska Elektriska Aktiebolaget: *See*—
Larsson, Hans Gunnar; and Westman, Erik, 4,064,723, Cl. 72-60.000.

Allyn, Charles L.; Manlove, James C.; Chang, Gerald M.; and Burmark, Robert C., to Reichhold Chemicals, Inc. Continuous process for the production of aqueous urea-formaldehyde solutions. 4,065,421, Cl. 260-29.40R.

Alter, Hobart L.; and Hutchinson, Peter L. V., to Coast Catamaran Corporation. Molding process. 4,065,337, Cl. 156-78.000.

Althausen, Ferdinand; and Raffel, Reiner, to Maschinenfabrik Hennecke GmbH. Mixing head for machines for producing multicomponent plastics. 4,065,106, Cl. 366-76.000.

Aluminum Company of America: *See*—
Booz, A. David, 4,065,060, Cl. 241-16.000.

Alyea, Frederick N.: *See*—
Zavitsanos, Peter D.; Golden, Joseph A.; and Alyea, Frederick N., 4,065,207, Cl. 350-312.000.

Amada Company, Limited: *See*—
Amano, Tadashi; Kawano, Susumu; Mano, Kenji; and Irisawa, Takaji, 4,064,727, Cl. 72-179.000.

Amano, Tadashi; Kawano, Susumu; Mano, Kenji; and Irisawa, Takaji, to Amada Company, Limited. Roll forming machine. 4,064,727, Cl. 72-179.000.

Amax Inc.: *See*—
Lussiez, Guy W.; and Reid, Hugh F., 4,065,105, Cl. 366-348.000.

Amdall, John K.; and Simmons, Gerald P., to Caterpillar Tractor Co.

Control pedal-mechanical speed with electrical direction control. 4,064,769, Cl. 74-878.000.

American Air Filter Company, Inc.: *See—*
Dahlem, Francis E., 4,065,277, Cl. 55-418.000.

American Can Company: *See—*
Detroit, William John; and Sanford, Michael Elliot, 4,065,318, Cl. 106-90.000.
Rentmeester, Kenneth R.; Jurcenko, John A.; and Welks, John D., 4,065,023, Cl. 220-75.000.
Sieverin, Walter Joseph, 4,064,737, Cl. 73-17.00R.

American Cyanamid Company: *See—*
Bambrick, William Edward, 4,065,407, Cl. 252-463.000.
Berkelhammer, Gerald; and Asato, Goro, 4,065,567, Cl. 424-272.000.
Casey, Donald James, 4,064,564, Cl. 2-168.000.
Gordon, Fred Morris, 4,065,558, Cl. 424-216.000.
Reger, David William; Garber, Murray; and Long, Don Wesley, 4,065,466, Cl. 260-327.00M.

American Filtrona Corporation: *See—*
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American Home Products: *See—*
McCaully, Ronald J.; Nudelman, Abraham; and Bell, Stanley C., 4,065,451, Cl. 260-239.30D.

American Home Products Corporation: *See—*
Chou, Chih H.; and Myers, Gordon S., 4,065,488, Cl. 260-467.000.
Strike, Donald Peter, 4,065,494, Cl. 260-514.00D.

American Warming and Ventilating Inc.: *See—*
Lichtenwald, Roger A., 4,064,670, Cl. 52-473.000.

AMSTED Industries Incorporated: *See—*
Mulcahy, Harry William, 4,064,809, Cl. 105-167.000.

Andersen, John A.; and Harty, Gene R., to United States of America, Energy Research and Development Administration. Nose tip locking device. 4,065,217, Cl. 403-24.000.

Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,065,429, Cl. 260-45.95G.

Anderson, Bror E.: *See—*
Schick, Margery L.; and Anderson, Bror E., 4,065,595, Cl. 428-141.000.

Anderson, David Robert; Anderson, Wilbert Cleon; and Jenkins, Vaughn Junior, to Sperry Rand Corporation. Reel servo control system. 4,065,074, Cl. 242-184.000.

Anderson, Wilbert Cleon: *See—*
Anderson, David Robert; Anderson, Wilbert Cleon; and Jenkins, Vaughn Junior, 4,065,074, Cl. 242-184.000.

Andersson, Rickard, to Linden-Alimak AB. Method and device for dismounting or mounting jib sections on a tower crane. 4,064,615, Cl. 29-426.000.

Ando, Shizuo: *See—*
Owaki, Kenichi; Ando, Shizuo; and Nakayama, Norihiko, 4,065,698, Cl. 313-489.000.

Andre, Michael G.; Schmidt, Melvin J.; and Osman, Kenneth L., to Methode Electronics, Inc. Flat cable wiring harness and method of producing same. 4,065,199, Cl. 339-17.00F.

Andrews, Philip S.; Farrissey, William J., Jr.; Onder, Besir K.; and Tilley, James N., to Upjohn Company, The. Copolyamide from arylene diamine and mixture of alkylene dicarboxylic acids. 4,065,441, Cl. 260-78.00R.

Andrillon, Patrick; and Bugaut, Andree, to L'Oreal. 2-Methyl-5-N-hydroxyalkylaminophenol in an oxidation dye composition and method of using the same. 4,065,255, Cl. 8-10.200.

ANIC, S.p.A.: *See—*
Moggi, Pietro Antonio; and Iori, Giuseppe, 4,065,469, Cl. 260-346.710.

Anthony, Albert M., to Tracor, Inc. Static convergence devices for color television picture tubes. 4,065,737, Cl. 335-212.000.

Anthony, James, to Fuller Company. Liners for crusher. 4,065,064, Cl. 241-299.000.

Anton, Rainer; Beyer, Ernst; and Bielefeld, Bodo, to Triumph Werke Nurnberg A.G. Printing ribbon. 4,064,982, Cl. 197-1.00R.

Apel, Fred B.; and Olson, Jerome B. Sound deadening means for use on a bar feeding machine. 4,064,773, Cl. 82-38.00A.

Apel, Gerhard: *See—*
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Aplicaciones Industriales de Cromo Duro, S.A.: *See—*
Ibarguengoitia, Juan Retolaza, 4,065,365, Cl. 204-25.000.

April, Joseph Richard: *See—*
Cunningham, James Thomas; Snow, Frederick Orren, III; April, Joseph Richard; and Yu, A. Tobey, 4,065,002, Cl. 214-14.000.

Apstein, Maurice; and Kalmus, Henry P., to United States of America, Army. Ultrasonic remote control system. 4,064,806, Cl. 102-70.20R.

Aqua Plex Products: *See—*
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Archibald Kenrick and Sons Limited: *See—*
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Armond, John Walter, to BOC International Limited. Oxygen-enriched air. 4,065,272, Cl. 55-25.000.

Armour and Company: *See—*
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Armstrong Cork Company: *See—*
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Armstrong, James E. Sheave forming method. 4,064,724, Cl. 72-108.000.

Armstrong, Kenneth Ronald: *See—*
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Armstrong, Lee R.: *See—*
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Rackliffe, Richard J.; Goodfriend, Harvey J.; and Armstrong, Lee R., 4,064,747, Cl. 73-116.000.

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Arrasmith, Fred Victor; Bruns, Donald George; Moffitt, John Stuart; and Moss, Stanton Kline, to International Business Machines Corporation. Apparatus for stacking documents in sequence. 4,065,123, Cl. 271-215.000.

Arrow-Acme Corporation: *See—*
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Asahara, Yoshijuki; and Izumitani, Tetsuro, to Hoya Glass Works, Ltd. Method for making a glass-based soft-edged aperture filters. 4,065,283, Cl. 65-30.00E.

Asahi Glass Co., Ltd.: *See—*
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Oda, Yoshio; Suhara, Manabu; and Endo, Eiji, 4,065,366, Cl. 204-98.000.

Asami, Hiroshi; and Kaji, Masao, to New Nippon Electric Co., Ltd. Method and apparatus for plating under constant current density. 4,065,374, Cl. 204-228.000.

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Asato, Goro: *See—*
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Ashland Oil, Inc.: *See—*
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Gannon, Charles R., 4,065,591, Cl. 428-36.000.
Shields, Theodore C., 4,065,498, Cl. 260-566.00F.

Ashley-Butler, Inc.: *See—*
Caplan, Sandor, 4,064,872, Cl. 128-2.00H.

Asp, Hans Eskil, to C. J. Wennberg AB. Method and device for stripping off, washing and drying surface treated objects in long lengths such as strip, wire, rod, sections or fibres. 4,064,884, Cl. 134-15.000.

Associated Electrical Industries Limited: *See—*
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Asta-Werke Aktiengesellschaft: *See—*
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Astatic Corporation, The: *See—*
Cvetko, Henry J.; and Kuykendall, John L., 4,065,134, Cl. 274-37.000.
Cvetko, Henry J.; and Peterson, Donald W., 4,065,648, Cl. 179-178.000.

Atkinson, Joseph George; Rooney, Clarence Stanley; Girard, Yves; and Engelhardt, Edward L., to Merck & Co., Inc. Amino acids and esters thereof useful as antihypertensive agents. 4,065,572, Cl. 424-273.00R.

Atlanta Metal Products, Inc.: *See—*
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Atlantic Richfield Company: *See—*
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Atlas Copco Aktiebolag: *See—*
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Atomic Energy of Canada Limited: *See—*
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Attwood, Stanley W., to Motorola, Inc. Multipath communications system. 4,065,718, Cl. 325-65.000.

Atwell, Max Raymond. Safety closure for portable receptacles. 4,065,024, Cl. 220-203.000.

Audiotronics Corporation: *See—*
Warner, Donald E.; and Oyama, George C., 4,065,645, Cl. 179-156.00R.

Augustin, Ulrich, to Daimler-Benz Aktiengesellschaft. Control mechanism for injection pump. 4,064,856, Cl. 123-140.00R.

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Baak, Nils Tryggve E. A.; and Rapp, Charles F., to Nippon Electric Glass Company, Ltd. Novel glass compositions. 4,065,317, Cl. 106-52.000.

Babb, Larry F.: *See—*
Dickey, John W.; and Babb, Larry F., 4,065,242, Cl. 425-384.000.

Babler, Egon S., to Teletype Corporation. Print hammer bumper exhibiting dual resiliency characteristics. 4,064,799, Cl. 101-93.020.

Bacha, John D.; Matthews, Joseph S.; and Selwitz, Charles M., to Gulf Research & Development Company. Process for producing maleic anhydride from mixture of five and six carbon hydrocarbons. 4,065,470, Cl. 260-346.750.

Bailey, David P., to Raymond Lee Organization, Inc., The. Gasoline supply accessory. 4,064,901, Cl. 137-351.000.

Bailey, Francis M., to General Electric Company. Static speed control circuit for polyphase induction motors. 4,065,704, Cl. 318-237.000.

Bailey, Frederick Eugene; von Dohlen, Werner Claus; Matzner, Markus; Young, Robert Hayward; and Robeson, Lloyd Mahlon, to Union Carbide Corporation. Gradient polymers of two or more alpha monoolefinic monomers capable of polymerizing with themselves and each other. 4,065,520, Cl. 260-878.00B.

Bailey, Wayne E., to Gulf Research & Development Company. Aryl diurea-thickened greases. 4,065,395, Cl. 252-25.000.

Baird, Albert W., III, to Beckman Instruments, Inc. Cathode assembly for two-dimensional scanned gas discharge display panel. 4,065,699, Cl. 315-169.0TV.

Baird, William C., Jr.: *See—*
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Baker Brush Co., Inc.: *See—*
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Ballantyne, Joseph M., to Cornell Research Foundation, Inc. Tunnel injection of minority carriers in semi-conductors. 4,065,780, Cl. 357-6.000.

Bambrick, William Edward, to American Cyanamid Company. Process for preparing shaped particles from rehydratable alumina. 4,065,407, Cl. 252-463.000.

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Barbier, Daniel; Ittel, Jean-Michel; and Poujois, Robert, to Commissariat a l'Energie Atomique. Alarm detector responsive to rate of change of a monitored condition. 4,065,758, Cl. 340-227.00R.

Barker International, Inc.: *See—*
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Barker, James E., to Cities Service Company. Energy conserving process for purifying iron oxide. 4,065,294, Cl. 75-3.000.

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Baron, William James; and Capano, Patrick John, to Western Electric Company, Incorporated. Printing ink. 4,065,316, Cl. 106-20.000.

Barrington, Burchus Q., to Halliburton Company. Annulus pressure operated closure valve with reverse circulation valve. 4,064,937, Cl. 166-162.000.

Barry, Leonard D. Container side-transfer system. 4,065,006, Cl. 214-42.00R.

Bart, Hansueli, to Eaton Corporation. Metering valve for pilot fuel injection. 4,064,845, Cl. 123-32.00G.

Bartels, Vernon A., to Schlage Lock Company. Fire-safe lever handle. 4,065,164, Cl. 292-347.000.

Barth, Horst: *See—*
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Bartley, Burton H.; and Estes, John H., to Texaco Inc. Preparation of methane. 4,065,514, Cl. 260-676.00R.

Bartok, Stephen, to Ideal Toy Corporation. Pin ball bumper mechanism with rotational drive. 4,065,129, Cl. 273-121.00A.

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Wild, Hans; Jeckel, Guenter; Echte, Adolf; Zizlsperger, Johann; Reffert, Rudi Wilhelm; and Thielen, Gunter, 4,065,532, Cl. 264-68.000.

Bateman, Mark E.; and Palmer, Jeffrey T., to Standard Oil Company (Indiana). Paper sizing process. 4,065,349, Cl. 162-158.000.

Batka, Robert J.: *See—*
Billington, Evans R.; and Batka, Robert J., 4,064,907, Cl. 137-614.200.

Baudoin, Patrice, to Regie Nationale des Usines Renault. Charging an accumulator by a heat engine. 4,064,694, Cl. 60-413.000.

Baum, Elliott W., to Berco Industries. Table leg locking mechanism. 4,064,815, Cl. 108-129.000.

Baxter Travenol Laboratories, Inc.: *See—*
Phillips, Thomas E., 4,065,093, Cl. 251-6.000.

Bayer Aktiengesellschaft: *See—*
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; and Nouvertne, Werner, 4,065,436, Cl. 260-47.0XA.
Bien, Hans-Samuel; and Harms, Wolfgang, 4,065,446, Cl. 260-146.00D.
Cohnen, Wolfgang; and Apel, Gerhard, 4,065,401, Cl. 252-350.000.
Fest, Christa; Enders, Edgar; Eue, Ludwig; and Schmidt, Robert R., 4,065,292, Cl. 71-99.000.
Frommer, Werner; Gericke, Horst; Keup, Uwe; Puls, Walter; Schmidt, Delt; and Wagner, Otto, 4,065,557, Cl. 424-181.000.
Hofer, Wolfgang; Schliebs, Reinhard; Schmidt, Robert; and Eue, Ludwig, 4,065,288, Cl. 71-76.000.
Lippert, Axel; Joisten, Siegfried; and Sajben, Johannes-Otto, 4,065,339, Cl. 156-149.000.
Mayer, Karl Heinrich; Hoffmeister, Friedrich; and Wuttke, Wolfgang, 4,065,568, Cl. 424-273.00P.
Schafer, Hermann; and Weber, Christian, 4,065,410, Cl. 260-2.5AM.
Spielberger, Georg; Wunderlich, Hermann; Klag, Gunther; and Zlokarnik, Marko, 4,065,492, Cl. 260-508.000.

Beach Manufacturing Corporation: *See—*
Czinger, David B., 4,064,803, Cl. 101-415.100.

Beam, John E.: *See—*
Reggio, Richard A.; Friello, Dominick R.; and Beam, John E., 4,065,578, Cl. 426-3.000.

Beard, Thomas N.: *See—*
Hill, David A.; Pearson, Durk J.; Motley, Ethelyn P.; Beard, Thomas N.; and Farrell, James L., 4,065,183, Cl. 299-4.000.

Beck, Heinz; Gabriel, Gerhard; and Poppel, Gunter, to Akzona Incorporated. Process for the preparation of cationic paper sizing agents. 4,065,608, Cl. 526-49.000.

Beck, Ivan: *See—*
Rakoczi, Jozsef; Beck, Ivan; Kiss, Csaba; Horvath, Imre; and Nemes, Miklos, 4,065,450, Cl. 260-239.00B.

Beck, James Richard; and Gajewski, Robert Peter, to Eli Lilly and Company. Herbicidal 2-methyl-4-phenyl-5-isoxazolinones. 4,065,463, Cl. 260-307.00A.

Becker, Kurt, to Hermann Heye. Machine for the production of containers or the like of vitreous material. 4,065,286, Cl. 65-229.000.

Becker, Phillip R. Safety motor control means for an electrically driven machine. 4,065,707, Cl. 318-285.000.

Beckman Instruments, Inc.: *See—*
Baird, Albert W., III, 4,065,699, Cl. 315-169.0TV.

Becton, Dickinson and Company: *See—*
Reno, Woodrow James, 4,064,871, Cl. 128-2.00G.

Beecham Group Limited: *See—*
Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, 4,065,457, Cl. 260-289.00K.

Behringwerke Aktiengesellschaft: *See—*
Bohn, Hans; and Stutzinger, Ferdinand, 4,065,445, Cl. 260-112.00B.

Behrmann, William C.: *See—*
Moser, John F., Jr.; and Behrmann, William C., 4,065,516, Cl. 260-683.470.

Beizerov, Semen Moiseevich; Vyboischikov, Felix Petrovich; Bloshenko, Vladimir Viktorovich; and Syaskin, Jury Mikhailovich. Skull furnace for melting highly reactive metals under vacuum or neutral atmosphere. 4,065,634, Cl. 13-10.000.

Bejarano, Thomas M.; Schmidt, Herbert; and Schmidt, Joseph J., to Builders Brass Works. Door closer. 4,064,589, Cl. 16-53.000.

Beke, Gunther Rudolf: *See—*
Kaan, Peter; and Beke, Gunther Rudolf, 4,064,963, Cl. 181-244.000.

Bell & Howell Company: *See—*
Fleischman, Andor A., 4,065,205, Cl. 350-216.000.

Bell, Robert A.: *See—*
Yount, Ronald E.; and Bell, Robert A., 4,065,659, Cl. 219-398.000.

Bell, Stanley C.: *See—*
McCaully, Ronald J.; Nudelman, Abraham; and Bell, Stanley C., 4,065,451, Cl. 260-239.30D.

Bell Telephone Laboratories: *See—*
Girod, Ronald Eugene, 4,065,643, Cl. 179-18.0AH.

Bell Telephone Laboratories, Incorporated: *See—*
Holtzman, Kenneth Allan, 4,065,368, Cl. 204-159.230.
Schuh, Peter Otto, 4,065,646, Cl. 179-170.00R.

Bell, Vernon L.: *See—*
Progar, Donald J.; Bell, Vernon L.; and St. Clair, Terry L., 4,065,345, Cl. 156-309.000.

Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., to Bristol-Myers Company. O-2-Isocephem-4-carboxylic acid derivatives as antibacterial agents. 4,065,623, Cl. 544-105.000.

Belleson, James Garman; and Clark, Kendall, to International Business Machines Corporation. Inspection tool. 4,065,212, Cl. 356-167.000.

Bena, Piero: *See—*
Siletto, Giorgio; Bena, Piero; and Cestari, Bruno, 4,065,121, Cl. 271-174.000.

Bendix Corporation, The: *See—*
Cramer, Robert L.; Dunbar, Jack E.; and Mientus, James A., 4,064,875, Cl. 128-142.200.
Deem, Brian Charles; Markert, Matthew Edward; and Latvala, Bruce Earl, 4,064,973, Cl. 188-71.700.
Ludwig, George C., 4,064,894, Cl. 137-116.500.
Sliwa, Robert A.; and Golden, Edward J., 4,065,709, Cl. 320-1.000.

Benjamin, Thomas A., to IPCO Hospital Supply Corporation. Sterile urine collection device. 4,064,760, Cl. 73-421.00R.

Bennett, Ira Michael. Expandable double walled smoke stack. 4,064,793, Cl. 98-58.000.

Bennett, Walter E., to Fox Valley Corporation. Package for wrapping paper. 4,064,990, Cl. 206-494.000.

Berard, Jean Claude, to Seb S.A. Electrical appliance for heating feeding-bottles and like containers. 4,065,660, Cl. 219-535.000.

Berco Industries: *See—*
Baum, Elliott W., 4,064,815, Cl. 108-129.000.

Berg, Lennart Gustaf. Valve for water pipes. 4,064,906, Cl. 137-529.000.

Bergdahl, Sven Gunnar: *See*—
Aberg, Sven Ulrik Torbjorn; and Bergdahl, Sven Gunnar, 4,065,347, Cl. 162-26.000.

Bergen, Richard F., to Xerox Corporation. Deformation imaging element. 4,065,308, Cl. 96-1.50R.

Berger, Richard M., to American Filtrona Corporation. Method and apparatus for making tobacco smoke filter. 4,064,791, Cl. 93-1.00C.

Bergman, John E.; Keeler, William T.; and McKenna, Patrick J., to Blair Tool and Machine Corporation. Brush roundstor. 4,064,658, Cl. 51-110.000.

Bergmann Kabelwerke AG: *See*—
Dahmen, Hans Peter, 4,064,916, Cl. 140-2.000.

Berkelhammer, Gerald; and Asato, Goro, to American Cyanamid Company. Substituted nitroimidazolyl thiadiazoles and oxadiazoles as antibacterial agents and growth promoting compounds. 4,065,567, Cl. 424-272.000.

Berry, James M., to Teletype Corporation. Method and apparatus for generating gray tones in an ink jet printer. 4,065,773, Cl. 346-75.000.

Berry, Thomas Royston, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Digital scan converters. 4,065,770, Cl. 343-5.0SC.

Bertovich, Matthew G., to Westinghouse Electric Corporation. Escalator having guide wheels and guide track with cooperative non-flat surfaces. 4,064,986, Cl. 198-326.000.

Betherb, Inc.: *See*—
Levine, Beth, 4,064,641, Cl. 36-1.500.

Betz, Erwin C. Non-uniform crimped metal ribbon packed catalyst bed and method using same. 4,065,268, Cl. 23-288.00F.

Beyer, Ernst: *See*—
Anton, Rainer; Beyer, Ernst; and Bielefeld, Bodo, 4,064,982, Cl. 197-1.00R.

Beyerlein, David G.: *See*—
Stewart, John A.; Hynes, Roy G.; Beyerlein, David G.; and Force, John B., 4,065,751, Cl. 340-58.000.

Beyers, Billy Wesley, Jr., to RCA Corporation. Voltage storage circuit useful in television receiver control applications. 4,065,681, Cl. 307-246.000.

Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Schrenk, Heinrich Maria, to Canada Packers Limited; and Institute of Microbiology and Hygiene of The University of Montreal, The. Antiviral 5-(substituted benzal) hydantoins. 4,065,570, Cl. 424-273.00R.

Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Schrenk, Heinrich Maria, to Canada Packers Limited; and Institute of Microbiology and Hygiene of The University of Montreal, The. Antiviral 5-(substituted benzal) hydantoins. 4,065,571, Cl. 424-273.00R.

Bianchi, John E.; and Nichols, Richard D. E., to Bianchi Leather Products, Inc. Spring assembly for front opening holster. 4,065,039, Cl. 224-2.00B.

Bianchi Leather Products, Inc.: *See*—
Bianchi, John E.; and Nichols, Richard D. E., 4,065,039, Cl. 224-2.00B.

Bianchi, Valerio: *See*—
Latsch, Reinhard; and Bianchi, Valerio, 4,064,846, Cl. 123-32.0EA.

Bielefeld, Bodo: *See*—
Anton, Rainer; Beyer, Ernst; and Bielefeld, Bodo, 4,064,982, Cl. 197-1.00R.

Bien, Hans-Samuel; and Harms, Wolfgang, to Bayer Aktiengesellschaft. Reactive dyestuffs containing urea alkylene linkage between chromophore and reactive radical. 4,065,446, Cl. 260-146.00D.

Biggane, John D., to Super Strut, Inc. Seismic brace. 4,065,218, Cl. 403-71.000.

Billand, William: *See*—
Warner, Richard F.; Billand, William; and Vincent, Riggi, 4,064,644, Cl. 40-152.000.

Billington, Evans R.; and Batka, Robert J., to Rego. Fill limiting filler valve unit. 4,064,907, Cl. 137-614.200.

Bindra, Jasjit Singh: *See*—
Schaaf, Thomas K.; and Bindra, Jasjit Singh, 4,065,472, Cl. 260-332.20C.

Birkelbach, Heinrich: *See*—
Wessendorf, Richard; Sommer, August; and Birkelbach, Heinrich, 4,065,506, Cl. 260-601.00R.

Bison-werke Bahre & Greten GmbH & Co. KG: *See*—
Greten, Berndt, 4,065,030 Cl. 222-55.000.
Padmanathan, Thurairajah, 4,065,477, Cl. 260-369.000.

Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., to Lear Siegler, Inc. Pot broach. 4,065,222, Cl. 407-18.000.

Bittner, Klaus-Jurgen: *See*—
Gerigk, Gunter; Bittner, Klaus-Jurgen; and Kostner, Armin, 4,064,673, Cl. 53-3.000.

Bjorklund, William J., to United States of America, Energy Research and Development Administration. Nuclear waste solidification. 4,065,400, Cl. 252-301.10W.

Black, Charles A. Oil drain bag. 4,064,969, Cl. 184-1.500.

Black and Decker Manufacturing Company, The: *See*—
Fleigle, Donald Earl, 4,064,680, Cl. 56-11.900.

Black, Dennis A., to General Motors Corporation. Variable capacity radial-4 compressor. 4,065,229, Cl. 417-270.000.

Blackburn Bobby J., to IRD Mechanalysis, Inc. Vibration analyzing apparat s. 4,064,704, Cl. 73-660.000.

Blair Tool and Machine Corporation: *See*—
Bergman, John E.; Keeler, William T.; and McKenna, Patrick J., 4,064,658, Cl. 51-110.000.

Blinne, Gerd; and Cordes, Claus, to BASF Aktiengesellschaft. Aromatic polyether-sulfones. 4,065,437, Cl. 260-49.000.

Bloshenko, Vladimir Viktorovich: *See*—
Beizerov, Semen Moiseevich; Vyboischikov, Felix Petrovich; Bloshenko, Vladimir Viktorovich; and Syaskin, Jury Mikhailovich, 4,065,634, Cl. 13-10.000.

BOC International Limited: *See*—
Armond, John Walter, 4,065,272, Cl. 55-25.000.

Bodnar, Alfred D., to General Motors Corporation. Uncoupled strut suspension system. 4,065,152, Cl. 280-668.000.

Bodnaruk, Bohdan J.: *See*—
Aktay, Ali I.; Bodnaruk, Bohdan J.; and Holowaty, Michael O., 4,065,385, Cl. 210-44.000.

Bodor, Nicolae S.; Sloan, Kenneth B.; and Hussain, Anwar A., to INTERx Research Corporation. N-Nicotinoyl-3,4-dinicotinoyloxy-L-phenylalanine and derivatives pharmaceutical compositions and methods containing same. 4,065,566, Cl. 424-266.000.

Boeckman, Maynard A.; and Singer, Richard M., to Kane Manufacturing Corporation. Emergency release for security panels. 4,064,719, Cl. 70-355.000.

Boersma, Richard F., to Fiat-Allis Construction Machinery, Inc. Control lever assembly. 4,064,767, Cl. 74-491.000.

Bofinger, Gunter: *See*—
Hofer, Gerald; Bofinger, Gunter; Nothdurft, Heinz; Khosrawi, Mohammad-Ali; Simon, Helmut; and Konrath, Karl, 4,065,236, Cl. 417-493.000.

Bogel, George F., to Westinghouse Electric Corporation. Solid-state limit switch utilizing infrared link. 4,065,669, Cl. 250-229.000.

Bohm, Eberhard: *See*—
Weckesser, Ernst; Sparwald, Volker; Reh, Lothar; Bohm, Eberhard; and Graf, Rolf, 4,065,271, Cl. 55-2.000.

Bohn, Hans; and Stutzinger, Ferdinand, to Behringwerke Aktiengesellschaft. Pregnancy-specific β_1-glycoprotein and process for isolating it. 4,065,445, Cl. 260-112.00B.

Boldebuck, Edith M.: *See*—
Lupinski, John H.; Boldebuck, Edith M.; and Barnes, Wilson J., 4,065,420, Cl. 260-29.20N.

Bolintineanu, Constantin: *See*—
Dumitrescu, Ioan Florin; Cojocaru, Constantin; and Bolintineanu, Constantin, 4,064,870, Cl. 128-2.00N.

Bolyos, Maria: *See*—
Lorincz, Csaba; Szasz, Kalman; Bolyos, Maria; Jovanovics, Karola; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,065,458, Cl. 260-293.550.

Bombled, Jean-Paul. Ball mill. 4,065,061, Cl. 241-81.000.

Bond, Andrew. Stringed instruments. 4,064,780, Cl. 84-314.000.

Bongort, Edgar A.; and Cruickshank, William T., to B/W Controls, Inc. Liquid level sensor. 4,064,755, Cl. 73-313.000.

Booz, A. David, to Aluminum Company of America. Metal flake production. 4,065,060, Cl. 241-16.000.

Bordovsky, Jaromir; and Katz, Klaus, to Daimler-Benz Aktiengesellschaft. Control valve for pressure-medium servo-motor. 4,064,789, Cl. 91-417.00R.

Borg-Warner Corporation: *See*—
Myers, Charles Louis; and Rinehart, Michael Kent, 4,065,522, Cl. 260-880.00R.

Borgen, Arden L.; and Merrill, Cleon C., to Arrow-Acme Corporation. Non-siphoning float controlled valve assembly. 4,064,895, Cl. 137-216.000.

Boroschewski, Gerhard; and Arndt, Friedrich, to Schering Aktiengesellschaft. Method for controlling the growth of weeds in a field containing growing plants of cotton. 4,065,293, Cl. 71-100.000.

Boyd, H. Edward; and Freiburger, Thomas M., to Cooper Industries, Inc. Tubing wrench with air powered return. 4,064,772, Cl. 81-57.130.

Bradley, John E., to Ford Motor Company. Starter/blower motor. 4,064,695, Cl. 60-517.000.

Brandenberger, Stanley G.: *See*—
McClure, James D.; and Brandenberger, Stanley G., 4,065,515, Cl. 260-683.680.

Brandenstein, Manfred: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; Burkl, Erich; and Kiener, Heinz, 4,065,193, Cl. 308-233.000.

Brandstrom, Karl Ivar, to AB Bofors. Device for inserting a hot, heavy blank in a die. 4,064,731, Cl. 72-419.000.

Brandt, H. David: *See*—
Goell, James E.; and Brandt, H. David, 4,065,203, Cl. 350-96.00C.

Braniff, Michael J.; and Waller, James L., to General Motors Corporation. Cushion retention for a vehicle seat. 4,065,182, Cl. 297-452.000.

Branson Ultrasonics Corporation: *See*—
Dussault, Jean G. M.; Geckle, Robert A.; and Puskas, William L., 4,064,885, Cl. 134-58.00R.

Bratt, Sven Ake; and Moberg, Carl Ake, to Atlas Copco Aktiebolag. Power wrench. 4,064,948, Cl. 173-12.000.

Bray Oil Co.: *See*—
Dickey, Charles R.; and Voorhees, Vanderveer, 4,065,396, Cl. 252-33.400.

Breads, Eugene H., to Renold Ajax Inc. Coupling for connecting a rotating member to a shaft. 4,064,708, Cl. 64-1.00V.

Brendel, Hugo; and Federau, Heinz, to Metzeler Schaum GmbH. Apparatus for producing sheeting having a fibrous surface. 4,065,245, Cl. 425-503.000.

Brennolt, Otto J.: *See*—
Kolthoff, Clyde Paul, Jr.; and Brennolt, Otto J., 4,064,934, Cl. 165-97.000.

Bridgestone Cycle Co. Ltd.: *See*—
Ohtani, Kiyoshi; and Takamiya, Kikuzo, 4,064,972, Cl. 188-24.000.

Bridon Limited: *See*—
Cawthorne, Stephen, 4,065,221, Cl. 403-284.000.

Brisko, Frank. Pollution control device. 4,064,892, Cl. 137-110.000.

Bristol-Myers Company: *See*—
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., 4,065,623, Cl. 544-105.000.
Horning, Donald E.; Morris, Leeson R.; and Douglas, James L., 4,065,622, Cl. 544-105.000.

British Petroleum Company Limited, The: *See*—
Gold, Roy Charles, 4,065,675, Cl. 250-576.000.

Broan Manufacturing Co., Inc.: *See*—
Wolbrink, David W.; Budyak, Robert J.; Sellinger, Du Wayne M.; and Kaepernick, William A., 4,064,798, Cl. 100-229.00A.

Brock, Norbert: *See*—
Emig, Peter; Pohle, Hans; Scheffler, Gerhard; Brock, Norbert; Lenke, Hans-Dieter; and Pohl, Jorg, 4,065,501, Cl. 260-570.600.

Brooks, Leslie John, to Rolls-Royce Limited. Attachment for attaching jet propulsion engines to fixed structure. 4,065,077, Cl. 244-54.000.

Brossi, Arnold; Pecherer, Benjamin; and Sunbury, Robert, to Hoffmann-La Roche Inc. Intermediates in the preparation of 2,3,4,5-tetrahydro-1H-3-benzazepines. 4,065,473, Cl. 260-340.50R.

Brouwer, Hendrik Willem, to Lever Brothers Company. Liquid soap composition. 4,065,398, Cl. 252-108.000.

Brown, Alberta Mae. Stethoscope. 4,064,965, Cl. 181-131.000.

Brown, David L.: *See*—
McClure, William F.; and Brown, David L., 4,064,944, Cl. 169-60.000.

Brown, John T.; and Morgan, David W., to Corning Glass Works. Electrical resistor and method of production. 4,065,656, Cl. 219-121.0LM.

Bruns, Donald George: *See*—
Arrasmith, Fred Victor; Bruns, Donald George; Moffitt, John Stuart; and Moss, Stanton Kline, 4,065,123, Cl. 271-215.000.

Brunswick Corporation: *See*—
Draxler, James Richard, 4,064,823, Cl. 115-17.000.
Roberts, John A.; and Roberts, Peter R., 4,065,046, Cl. 228-156.000.

Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, to Beecham Group Limited. 4-Hydroxy-3-nitro-carbostyril compounds. 4,065,457, Cl. 260-289.00K.

Budyak, Robert J.: *See*—
Wolbrink, David W.; Budyak, Robert J.; Sellinger, Du Wayne M.; and Kaepernick, William A., 4,064,798, Cl. 100-229.00A.

Bugaut, Andree: *See*—
Andrillon, Patrick; and Bugaut, Andree, 4,065,255, Cl. 8-10.200.

Buhler, Arthur; Fasciati, Alfred; and Schlumpf, Karl, to Ciba-Geigy Corporation. Process for dyeing and printing. 4,065,254, Cl. 8-1.00C.

Builders Brass Works: *See*—
Bejarano, Thomas M.; Schmidt, Herbert; and Schmidt, Joseph J., 4,064,589, Cl. 16-53.000.

Bullock, Norman J., to W. M. Cissell Manufacturing Company. Laundry dryer. 4,065,253, Cl. 432-105.000.

Bunker Ramo Corporation: *See*—
Patten, Hudson Taylor; and Woodcock, Floyd Baylie, 4,065,747, Cl. 340-5.00R.

Bureau BBR Ltd.: *See*—
Siegwart, Hans-Rudolf; and Kaser, Rene, 4,065,098, Cl. 254-29.00A.

Burkl, Erich: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; Burkl, Erich; and Kiener, Heinz, 4,065,193, Cl. 308-233.000.

Burmark, Robert C.: *See*—
Allyn, Charles L.; Manlove, James C.; Chang, Gerald M.; and Burmark, Robert C., 4,065,421, Cl. 260-29.40R.

Burroughs Corporation: *See*—
Panigrahi, Godavarish, 4,065,756, Cl. 365-49.000.

Burstein, Albert H.; and Koslin, Bertram L., to Sampson Corporation, The. Prosthesis-to-bone interface system. 4,064,567, Cl. 3-1.910.

Burton, Clyde L.: *See*—
Tennes, Bernard R.; and Burton, Clyde L., 4,064,683, Cl. 56-328.0TS.

Burton, George William, to Johnsen & Jorgensen (Plastics) Limited. Safety container and closure. 4,065,017, Cl. 215-211.000.

Burton, Parsons and Company, Inc.: *See*—
Rankin, Billy F., 4,065,324, Cl. 134-30.000.

Burton, William D. Loudspeaker apparatus. 4,064,966, Cl. 181-144.000.

Busdiecker, Wayne Scott; and Seymour, Harold Henry, to Parker-Hannifin Corporation. Flexible reinforced hose and method of making the same. 4,064,913, Cl. 138-125.000.

Bushev, Vladimir Semenovich: *See*—
Evkin, Ivan Frolovich; Petrov, Vladimir Alexandrovich; Olevsky, Viktor Markovich; Ruchinsky, Vitaly Rafael-Abovich; Bushev, Vladimir Semenovich; and Tatyanchikov, Valentin Alexeevich, 4,065,346, Cl. 159-6.00R.

Bussell, George W.; and Kisel, Martin W., to Inmont Corporation. Process for the preparation of non-aqueous dispersion coatings. 4,065,425, Cl. 260-33.6EP.

Bustos, Rafael T. Display rack. 4,064,995, Cl. 211-187.000.

Butler, Walter J.; and Eichelberger, Charles W., to General Electric Company. Analog-to-digital converter. 4,065,766, Cl. 340-347.0AD.

Buyssens, Noel; and Verbauwhede, Germain, to N.V. Bekaert S.A. Reinforcement of resilient articles. 4,064,915, Cl. 139-425.00R.

Byrne, Robert Edward, to Research-Cottrell. Production of amber glass. 4,065,281, Cl. 65-19.000.

C. Conradty Nurnberg GmbH & Co. KG: *See*—
Zollner, Christine; Thiele, Gerhard; Zollner, Dieter; and Koziol, Konrad, 4,065,377, Cl. 204-290.00F.

C. J. Wennberg AB: *See*—
Asp, Hans Eskil, 4,064,884, Cl. 134-15.000.

C.M.W. Laboratories Limited: *See*—
Killick, Herbert Percy, 4,064,630, Cl. 32-22.000.

Cabofina S. A.: *See*—
Verborgt, Jozef, 4,065,438, Cl. 260-75.00R.

Cadwalader, Louise G. Ski seat. 4,065,140, Cl. 280-11.37E.

Cahill, Sutton & Thomas: *See*—
Calderone, Joseph F., 4,064,573, Cl. 4-227.000.

Cainaud, Henri, to Societe des Etablissements Hugonnet. Cistern container. 4,065,022, Cl. 220-71.000.

Calderone, Joseph F., to Cahill, Sutton & Thomas. Cleanser-sanitizer and timed cycle deodorizing spray attachment for toilets. 4,064,573, Cl. 4-227.000.

Caldwell, Harold B., to Whiting Corporation. Apparatus for manufacturing phosphoric acid. 4,065,266, Cl. 23-259.200.

California Institute of Technology: *See*—
Gover, Avraham; Samid, Ilan; and Lee, Chien-Ping, 4,065,729, Cl. 331-94.50H.

California Strolee, Inc.: *See*—
Hyde, Richard E.; and Carmichael, Lee T., 4,065,177, Cl. 297-327.000.

Callahan, James L.: *See*—
Hardman, Harley F.; Callahan, James L.; and Grasselli, Robert K., 4,065,507, Cl. 260-604.00R.

Callan, John E., to Cities Service Company. Gun-type dispenser for heat softenable adhesive or sealant compounds. 4,065,034, Cl. 222-146.0HE.

Campbell, Gordon M. Water well monitor. 4,065,226, Cl. 417-40.000.

Campbell, Harry E. Artificial polycentric knee joint. 4,064,569, Cl. 3-26.000.

Campbell, Robert H.; and Wise, Raleigh W., to Monsanto Company. Vulcanization of rubber with phosphinothioyl amino sulfides. 4,065,443, Cl. 260-79.50B.

Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence: *See*—
Hutchison, Thomas Sherret; and McBride, Stuart Livingstone, 4,064,735, Cl. 73-1.00R.

Canada Packers Limited: *See*—
Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Schrenk, Heinrich Maria, 4,065,570, Cl. 424-273.00R.
Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Schrenk, Heinrich Maria, 4,065,571, Cl. 424-273.00R.
Khouw, Boen Tie; and Kesler, Johan Peter, 4,065,355, Cl. 195-66.00R.

Canadian Patents and Development Limited: *See*—
Dyck, George J., 4,064,955, Cl. 177-134.000.
Wong, James Y.; Kashyap, Satish C.; and Dunn, John G., 4,065,655, Cl. 219-10.55D.

Canon Kabushiki Kaisha: *See*—
Houryu, Sakae, 4,065,764, Cl. 340-324.00M.
Mikada, Hiroyuki; and Kishimoto, Jyuji, 4,065,803, Cl. 361-88.000.
Miura, Genmei; and Takeshita, Kanou, 4,065,754, Cl. 340-166.00R.

Cantello, Barrie Christian Charles: *See*—
Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, 4,065,457, Cl. 260-289.00K.

Capano, Patrick John: *See*—
Baron, William James; and Capano, Patrick John, 4,065,316, Cl. 106-20.000.

Caplan, Sandor, to Ashley-Butler, Inc. Temperature measuring device of a liquid crystal laminate. 4,064,872, Cl. 128-2.00H.

Cappel, Fred; Hastik, Walter; Fleming, Georges; and Hofmann, Pierre, to Dravo Corporation. Sinter machine control as a function of waste gas temperature. 4,065,295, Cl. 75-5.000.

Carella, Richard F.; and Perry, Thomas W., to General Motors Corporation. Easy enter seat assembly. 4,065,178, Cl. 297-341.000.

Cares, William R., to Petro-Tex Chemical Corporation. Iso-C_4 compound reactions with perfluorosulfonic acid resin catalysts. 4,065,512, Cl. 260-641.000.

Carl Schenck AG, Firma: *See*—
Giers, Alfred; Holdinghausen, Paul; Schneider, Hatto; and Widmann, Friedman, 4,064,761, Cl. 73-462.000.

Carlo Erba, S. p. A.: *See*—
Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, 4,065,467, Cl. 260-345.200.

Carlson, Guy C., Jr.: *See*—
Haak, Willard Q.; and Carlson, Guy C., Jr., 4,064,790, Cl. 91-492.000.

Carmichael, Lee T.: *See*—
Hyde, Richard E.; and Carmichael, Lee T., 4,065,177, Cl. 297-327.000.

Caron, Marshall J., to Florida Machine of Boca Raton. Filter system for swimming pool cleaning machines. 4,064,586, Cl. 15-1.700.

Carr, Thomas W.: *See*—
Mang, Raymond L.; and Carr, Thomas W., 4,065,284, Cl. 65-114.000.

Carrier Corporation: *See*—
Miller, William H., Jr.; and Geary, Carl H., 4,065,136, Cl. 277-3.000.

Ratledge, Houston, 4,065,008, Cl. 214-83.300.
Schanzenbach, George P., Jr.; and Mizikar, David M., 4,064,764, Cl. 74-2.000.
Carson Industries, Inc.: *See—*
Carson, John Reese, 4,065,020, Cl. 220-18.000.
Carson, John Reese, to Carson Industries, Inc. Meter box having rotatable cover and interlocking means. 4,065,020, Cl. 220-18.000.
Carter, Duane L. Supporting pier with tie-down. 4,064,668, Cl. 52-295.000.
Carter, Everett M.; and Quain, Wilbur C., to Lake Center Industries. Pressure sensitive matrix switch having apertured spacer with flexible double sided adhesive intermediate and channels optionally interposed between apertures. 4,065,649, Cl. 200-5.00A.
Cary, Charles C., to Roll-Out Insulation Systems, Inc. Weather responsive insulation system for greenhouses and the like. 4,064,648, Cl. 47-17.000.
Casey, Donald James, to American Cyanamid Company. Chitin derived surgical glove powder. 4,064,564, Cl. 2-168.000.
Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,064,687, Cl. 58-4.00A.
Casson, William Ernest, to McMurdo Instrument Company Limited, The. Electric reserve batteries. 4,065,606, Cl. 429-198.000.
Castle, William Harold; Crowe, William Ray; and Herriford, James Lester, to International Business Machines Corporation. Selectable dual ratchet feed for a printer platen. 4,064,985, Cl. 197-114.00R.
Caterpillar Tractor Co.: *See—*
Amdall, John K.; and Simmons, Gerald P., 4,064,769, Cl. 74-878.000.
Cole, Carroll Richard, 4,064,947, Cl. 172-781.000.
Haak, Willard Q.; and Carlson, Guy C., Jr., 4,064,790, Cl. 91-492.000.
McMillan, William D., 4,065,228, Cl. 417-212.000.
Ostrowski, Richard C., 4,064,927, Cl. 164-244.000.
Rinaldo, James D., 4,064,766, Cl. 74-473.00R.
Stedman, Robert N.; and Simmons, Gerald P., 4,064,959, Cl. 180-139.000.
Catlett, John C., to Kelley Company, Inc. Traffic door. 4,064,924, Cl. 160-354.000.
Cavin, Daniel C., to Shell Oil Company. Plugging permeable earth formation with wax. 4,064,943, Cl. 166–281.
Cawthorne, Stephen, to Bridon Limited. Clamp for sheathed rod, strand or rope. 4,065,221, Cl. 403-284.000.
CBS Inc.: *See—*
Meshulam, Avram; and Rebold, Jerome I., 4,064,626, Cl. 30-287.000.
Rossi, John P., 4,065,784, Cl. 358-13.000.
Cecere, Francesco; Galli, Giuliano; Della Penna, Gino; and Rappuoli, Bruno, to Snamprogetti, S.p.A. Method for the preparation of D-carbamyl aminoacids and the corresponding D-aminoacids. 4,065,353, Cl. 195-2.000.
Central Glass Company, Limited: *See—*
Chujo, Yoshimasa; and Kandachi, Takayoshi, 4,064,832, Cl. 118-323.000.
Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See—*
Paulus, Philippe; and Econompoulos, Mario, 4,065,329, Cl. 148-18.000.
Centre Electronique Horloger S.A.: *See—*
Hermann, Jean; and Choffat, Hubert, 4,065,684, Cl. 310-351.000.
Centrul de Protectia si Igiena Muncii: *See—*
Dumitrescu, Ioan Florin; Cojocaru, Constantin; and Bolintineanu, Constantin, 4,064,870, Cl. 128-2.00N.
Cestari, Bruno: *See—*
Siletto, Giorgio; Bena, Piero; and Cestari, Bruno, 4,065,121, Cl. 271-174.000.
Chadwick, Ronald M.; and Shearlock, David A., to National Steel Corporation. Method and apparatus for reseaing the large bell rod in a double bell charging system for a blast furnace. 4,065,004, Cl. 214-36.000.
Chambers, Alan B.: *See—*
Vykukal, Hubert C.; Chambers, Alan B.; and St. John, Roy H., 4,064,642, Cl. 36-92.000.
Chambers, Carter Carl. Wheeled vehicle for semi-ambulatory medical patients. 4,065,145, Cl. 280-87.02R.
Chan, Peter, to Raymond Lee Organization, Inc., The, a part interest. Multipurpose game apparatus. 4,065,125, Cl. 273-5.00R.
Chang, Gerald M.: *See—*
Allyn, Charles L.; Manlove, James C.; Chang, Gerald M.; and Burmark, Robert C., 4,065,421, Cl. 260-29.40R.
Chastain, Edward L.: *See—*
Gustafson, Kenneth C.; and Chastain, Edward L., 4,065,538, Cl. 264-154.000.
Cheadle, Brian A., to Atomic Energy of Canada Limited. High strength Sn-Mo-Nb-Zr alloy tubes and method of making same. 4,065,328, Cl. 148-12.70B.
Chemetron Corporation: *See—*
Moore, Donald G., 4,065,654, Cl. 219-10.55F.
Chernock, Stephen Peter. Valve assembly. 4,065,029, Cl. 222-3.000.
Chesnutt, Gary A., to Ashland Oil, Inc. Apparatus for producing carbon black. 4,065,265, Cl. 23-259.500.
Chevron Research Company: *See—*
Kobzina, John W., 4,065,291, Cl. 71-95.000.
Lavigne, Joe B., 4,065,424, Cl. 260-31.8DB.
Chimkombinat: *See—*
Sendov, Stoyan Hristov; Nikolov, Ivan Angelov; Kuklin, Ivan Alexandrov; and Mirchev, Mircho Georgiev, 4,065,393, Cl. 210-377.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Pfliegel, Todor; Seres, Jeno; Gajary, Antal; Daroczy nee Csuka, Klara; and Nagy, Lajos T., 4,065,491, Cl. 260-502.500.
Chizhikov, Anatoly Petrovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Lurie, Mikhail Vladimirovich; Topolyansky, Jury Arnoldovich; Kantor, Ilya Solomonovich; Chizhikov, Anatoly Petrovich; and Gun, Dmitry Rudolfovich, 4,065,076, Cl. 243-38.000.
Choffat, Hubert: *See—*
Hermann, Jean; and Choffat, Hubert, 4,065,684, Cl. 310-351.000.
Chomerics, Inc.: *See—*
Kuist, Charles H.; Squitieri, Vincent; and Seeger, Richard E., 4,065,197, Cl. 339-17.00M.
CHON Corporation: *See—*
Oppolzer, Wolfgang, 4,065,496, Cl. 260-561.00R.
Chou, Chih H.; and Myers, Gordon S., to American Home Products Corporation. Process for preparing 1,4:3,6-dianhydro-D-glucitol 2-nitrate. 4,065,488, Cl. 260-467.000.
Christenson, Roger M.; and Evjen, Clarence E., to PPG Industries, Inc. Water-based coatings with improved sagging and popping characteristics. 4,065,415, Cl. 260-17.4SG.
Christenson, Roger M.; and Evjen, Clarence E., to PPG Industries, Inc. Water-based coatings with reduced solvent or water popping and sagging. 4,065,416, Cl. 260-17.4SG.
Chromy, Franz, to Hilti Aktiengesellschaft. Electropneumatic hammer. 4,064,949, Cl. 173-14.000.
Chujo, Yoshimasa; and Kandachi, Takayoshi, to Central Glass Company, Limited. Apparatus for fabricating heat-reflecting glass. 4,064,832, Cl. 118-323.000.
Chun, Ho-ming: *See—*
Lundmark, Larry D.; Melby, Allan; and Chun, Ho-ming, 4,065,422, Cl. 260-29.60E.
Ciba-Geigy AG: *See—*
Muller, Willy, 4,065,448, Cl. 260-176.000.
Seha, Zdenek, 4,065,478, Cl. 260-382.000.
Stanfield, Zenas Allen, 4,064,638, Cl. 34-174.000.
Ciba-Geigy Corporation: *See—*
Buhler, Arthur; Fasciati, Alfred; and Schlumpf, Karl, 4,065,254, Cl. 8-1.00C.
Coe, Gervase; and Lee, Frank, 4,065,257, Cl. 8-74.000.
Cseh, Georg, 4,065,449, Cl. 260-176.000.
Frey, Christoph; and von der Crone, Jost, 4,065,462, Cl. 260-299.000.
Karrer, Friedrich, 4,065,508, Cl. 260-613.00R.
L'Eplattenier, Francois; and Vuitel, Laurent, 4,065,481, Cl. 260-438.100.
Muller, Albrecht; Haug, Theobald; and Renner, Alfred, 4,065,433, Cl. 260-47.0UA.
Cincinnati Electronics Corporation: *See—*
Petersen, Virgil F.; and Skirvin, Willard L., 4,064,898, Cl. 137-240.000.
Cities Service Company: *See—*
Barker, James E., 4,065,294, Cl. 75-3.000.
Callan, John E., 4,065,034, Cl. 222-146.0HE.
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,065,402, Cl. 252-358.000.
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,065,403, Cl. 252-358.000.
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,065,404, Cl. 252-358.000.
Citizen Watch Co., Ltd.: *See—*
Yasuda, Tetsuya; Iinuma, Yoshio; Maekawa, Yuzo; Kato, Toshikiyo; and Yoshida, Masaru, 4,064,689, Cl. 58-50.00R.
Clark Equipment Company: *See—*
Doolittle, Mac R., 4,064,967, Cl. 180-155.000.
Rocco, Jack O., 4,065,012, Cl. 214-510.000.
Clark, Kendall: *See—*
Belleson, James Garman; and Clark, Kendall, 4,065,212, Cl. 356-167.000.
Clark, Trevor Percival. Freeze/thaw indicator. 4,064,828, Cl. 116-114.500.
Clarke, Geoffrey, to Square D Company. Circuitry for industrial logic systems. 4,065,683, Cl. 307-264.000.
Clay, Clifton. Fur and hides in the fine arts. 4,065,334, Cl. 156-68.000.
Coast Catamaran Corporation: *See—*
Alter, Hobart L.; and Hutchinson, Peter L. V., 4,065,337, Cl. 156-78.000.
Coe, Gervase; and Lee, Frank, to Ciba-Geigy Corporation. Inhibition of dye staining during laundering of textile materials. 4,065,257, Cl. 8-74.000.
Cohen, Harvey M.: *See—*
Megowen, William J.; and Cohen, Harvey M., 4,065,018, Cl. 215-231.000.
Cohnen, Wolfgang; and Apel, Gerhard, to Bayer Aktiengesellschaft. Blowing agent mixture. 4,065,401, Cl. 252-350.000.
Coibion, Jean, to Saft-Societe des Accumulateurs Fixes et de Traction. Rack for a storage battery. 4,065,603, Cl. 429-99.000.
Cojocaru, Constantin: *See—*
Dumitrescu, Ioan Florin; Cojocaru, Constantin; and Bolintineanu, Constantin, 4,064,870, Cl. 128-2.00N.

Cole, Carroll Richard, to Caterpillar Tractor Co. Draw bar for a motor grader. 4,064,947, Cl. 172-781.000.

Cole, Clinie E., to Phillips Petroleum Company. Carbon black pelleter with even pin distribution. 4,065,240, Cl. 425-222.000.

Collins, Jr.; Watson R.; and Kokinda, James J., to Air Products and Chemicals, Inc. Pressure regulator and safety relief valve. 4,064,890, Cl. 137-73.000.

Collins, Kenneth L., to Gulf Oil Corporation. Shear sub for drill string. 4,064,953, Cl. 175-321.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku, 4,065,086, Cl. 248-188.600.

Commanda, Ephrem. Foldable picnic table. 4,064,812, Cl. 108-36.000.

Commissariat a l'Energie Atomique: *See*—
Barbier, Daniel; Ittel, Jean-Michel; and Poujois, Robert, 4,065,758, Cl. 340-227.00R.

Conklin, Hale, to Divajex. Method of making a wall section for a thermal enclosure. 4,065,336, Cl. 156-69.000.

Connizzoli, Mario; Peviani, Camillo; and Maietti, Francesca. Apparatus for pre-freezing substances of products intended to be pre-freezed. 4,064,707, Cl. 62-374.000.

Container Corporation of America: *See*—
Pilz, William M., III, 4,065,048, Cl. 229-43.000.

Continental Oil Company: *See*—
Sparlin, Derry D., 4,064,940, Cl. 166-295.000.
Waters, Kenneth H.; and Rice, George W., 4,065,749, Cl. 340-15.5MC.

Contractor, Rashmikant Maganlal; Dodson, William Carter, Jr.; Hentges, James John; and Seppala, Earl Edwin, to Du Pont de Nemours, E. I., and Company. Prevention of fibers from entering the pinch point between a rotating feed roll and a stationary shoe. 4,064,597, Cl. 19-156.300.

Conway, Terry T.: *See*—
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., 4,065,623, Cl. 544-105.000.

Cook, Harriet J.: *See*—
Yamazaki, Toshio; Cook, Harriet J.; and Lipson, Melvin A., 4,065,315, Cl. 96-48.0QP.

Cook, William B., Jr., to Santa Fe International Corporation. Scaffold for working on a pipeline movable relative to a base. 4,064,968, Cl. 182-13.000.

Cooper Industries, Inc.: *See*—
Boyd, H. Edward; and Freiburger, Thomas M., 4,064,772, Cl. 81-57.130.

Cooper, Jack B. Tile grout-cleaning tool. 4,064,588, Cl. 15-236.00R.

Copeland, Donald R. Quick disconnect anchor. 4,064,811, Cl. 105-476.000.

Cordes, Claus: *See*—
Blinne, Gerd; and Cordes, Claus, 4,065,437, Cl. 260-49.000.

Cormany, Charles L., to PPG Industries, Inc. Degreasing process using stabilized methylchloroform solvent. 4,065,323, Cl. 134-10.000.

Cornell Research Foundation, Inc.: *See*—
Ballantyne, Joseph M., 4,065,780, Cl. 357-6.000.

Corning Glass Works: *See*—
Brown, John T.; and Morgan, David W., 4,065,656, Cl. 219-121.0LM.
Herczog, Andrew, 4,065,636, Cl. 174-52.00S.

Corno, Maria Luisa: *See*—
Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, 4,065,467, Cl. 260-345.200.

Corporate Brands, Inc.: *See*—
Flanagan, John J., 4,065,409, Cl. 252-528.000.

Costa, Giovanni Giacomo. Method of detecting malignant neoplasms. 4,065,552, Cl. 424-1.000.

Cowen, Lloyd G. Numerical combination replacement plug for cylinder locks. 4,064,718, Cl. 70-302.000.

Cramer, Clark Evans; Gaetjen, John Richard; Grant, Carl Henry; Nelson, Paul Eugene; and Newlin, Frank Allen, III, to International Business Machines Corporation. Data transfer system. 4,065,810, Cl. 364-200.000.

Cramer, Robert L.; Dunbar, Jack E.; and Mientus, James A., to Bendix Corporation, The. Anti-suffocation means for aircraft breathing mask. 4,064,875, Cl. 128-142.200.

Crane, Edward J., to Barker International, Inc. Apparatus for processing poultry. 4,064,596. Cl. 17-11.10R.

Crankshaw, John H., to Dynetics, Inc. Synchronizing clutch. 4,064,979, Cl. 192-53.00F.

Cremer, Rene: *See*—
Dujardin, Esther; Kuiper, Ysbrand; Cremer, Rene; and Sironval, Cyrille, 4,065,310, Cl. 96-27.00R.

Creusot-Loire: *See*—
Leroy, Pierre; and Sprunck, Emile, 4,065,159, Cl. 285-136.000.

Croft, Edward F. B.; and Lane, John J., to Associated Electrical Industries Limited. Furnaces. 4,065,251, Cl. 432-59.000.

Crosby, Edward Lewis, Jr., to RCA Corporation. Apparatus and method for measuring permeability. 4,064,740, Cl. 73-38.000.

Crounse, Nathan N.: *See*—
Jefferies, Patrick J.; and Crounse, Nathan N., 4,065,500, Cl. 260-567.60M.

Crouse, Dennis N.: *See*—
Ajami, Alfred M.; Walsh, Fraser M.; and Crouse, Dennis N., 4,065,601, Cl. 429-50.000.

Crowe, William Ray: *See*—
Castle, William Harold; Crowe, William Ray; and Herriford, James Lester, 4,064,985, Cl. 197-114.00R.

Crown Cork & Seal Company, Inc.: *See*—
Eissler, John C., 4,065,035, Cl. 222-153.000.
Potts, Vinson S., 4,065,025, Cl. 220-258.000.

Cruickshank, William T.: *See*—
Bongort, Edgar A.; and Cruickshank, William T., 4,064,755, Cl. 73-313.000.

Cseh, Georg, to Ciba-Geigy Corporation. Tetrachloro substituted disazo pigments. 4,065,449, Cl. 260-176.000.

Cser, Gyula, to Autoipari Kutato Intezet. Live-gas conduit system for turbocharged six-cylinder engines. 4,064,696, Cl. 60-598.000.

Cub, Fritz, to Robert Bosch GmbH. Method of making a liquid filter. 4,065,341, Cl. 156-187.000.

Cummings, Thomas R.; and Mazza, Anthony J., Jr., to Singer Company, The. Four-point ground reaction for skid equipped helicopters. 4,064,640, Cl. 35-12.00K.

Cunningham, James Thomas; Snow, Frederick Orren, III; April, Joseph Richard; and Yu, A. Tobey, to Orba Corporation. Pocket door ship loader. 4,065,002, Cl. 214-14.000.

Currey, Thomas A. Ophthalmoscope. 4,065,208, Cl. 351-6.000.

Cvetko, Henry J.; and Kuykendall, John L., to Astatic Corporation, The. Needle assemblies for phonograph pickup cartridges. 4,065,134, Cl. 274-37.000.

Cvetko, Henry J.; and Peterson, Donald W., to Astatic Corporation, The. Microphone screen. 4,065,648, Cl. 179-178.000.

Czinger, David B., to Beach Manufacturing Corporation. Printing saddle with rocker arm lockup. 4,064,803, Cl. 101-415.100.

Dague, Leonard P.: *See*—
Hou, Shou L.; Dague, Leonard P.; and Agrawal, Arun K., 4,065,775, Cl. 346-140.00R.

Dahl, Erik Qvale, to Elkem-Spigerverket A/S. Method of recovering fluorine from carbonaceous waste material. 4,065,551, Cl. 423-483.000.

Dahlberg, Stig Erland; and Gellerstedt, Nils Goran Axel, to AB Bofors. Device for pyrotechnical illuminating charge. 4,064,805, Cl. 102-35.000.

Dahlem, Francis E., to American Air Filter Company, Inc. Inlet for cyclone-type particulate matter gas separator device. 4,065,277, Cl. 55-418.000.

Dahmen, Hans Peter, to Bergmann Kabelwerke AG. Arrangement for intermittent feeding of cable coils arresting on a distribution conveyor. 4,064,916, Cl. 140-2.000.

Daimler-Benz Aktiengesellschaft: *See*—
Augustin, Ulrich, 4,064,856, Cl. 123-140.00R.
Bordovsky, Jaromir; and Katz, Klaus, 4,064,789, Cl. 91-417.00R.
Fabian, Frank-Dietrich; and Leucht, Rainer, 4,065,170, Cl. 296-37.100.
Pabst, Rolf; and Jenz, Siegfried, 4,064,848, Cl. 123-41.540.

Danfoss A/S: *See*—
Gosling, Alexander Benett; and Mealing, Barrie Ewart, 4,065,706, Cl. 318-254.000.

D'Angelo, Raymond W. Mounting rack for circuit panels. 4,065,200, Cl. 339-65.000.

Daroczy nee Csuka, Klara: *See*—
Pfliegel, Todor; Seres, Jeno; Gajary, Antal; Daroczy nee Csuka, Klara; and Nagy, Lajos T., 4,065,491, Cl. 260-502.500.

Darringer, Richard E.; and Wrighton, Robert J., to Telatemp Corporation. Temperature indicating device. 4,064,827, Cl. 116-114.00Y.

Dart Industries, Inc.: *See*—
Kiss, Kornel D., 4,065,635, Cl. 174-23.00R.

Dash, Arthur: *See*—
Warner, Richard F.; Billand, William; and Vincent, Riggi, 4,064,644, Cl. 40-152.000.

Daum, Dennis: *See*—
Daum, Emill F.; Daum, Terry R.; and Daum, Dennis, 4,065,214, Cl. 401-2.000.

Daum, Emill F.; Daum, Terry R.; and Daum, Dennis. Portable wax applicator and remover. 4,065,214, Cl. 401-2.000.

Daum, Terry R.: *See*—
Daum, Emill F.; Daum, Terry R.; and Daum, Dennis, 4,065,214, Cl. 401-2.000.

Davis, Chester. Recording sheet for forming intensely colored iridescent indicia. 4,065,158, Cl. 282-27.500.

Davis, Dan Bryan, to Northern Telecom Limited. Mounting of a measuring head for positioning relative to a structure. 4,064,634, Cl. 33-147.00L.

Dayton-Walther Corporation: *See*—
Walther, William D., 4,065,186, Cl. 301-12.00R.

DDSA Pharmaceuticals Limited: *See*—
Shenoy, Umakant Devdas, 4,065,474, Cl. 260-347.700.

De Beukelaar, Jan W.; Van Zwet, Henry; and Roest, Jacob B., to Shell Oil Company. Treatment of contaminated hydrocarbon from olefin polymerization. 4,065,610, Cl. 526-70.000.

De Cosimo, Michael J. Complete system for a home air heating and cooling, hot and cold water, and electric power. 4,065,055, Cl. 237-12.100.

Deem, Brian Charles; Markert, Matthew Edward; and Latvala, Bruce Earl, to Bendix Corporation, The. Actuating and adjusting mechanism for disc brakes. 4,064,973, Cl. 188-71.700.

Deets, Gary L., to Monsanto Company. Polymethylmethacrylate based molding compositions. 4,065,428, Cl. 260-45.75B.

Defares, Peter Bernard; van der Schaar, Wouter Wies; and Verveen, Eduard Theodorus. Apparatus for regulating the breathing pattern. 4,064,869, Cl. 128-2.00R.

Dehart, Scott Alan, to Hewlett-Packard Company. Digital data decoder. 4,065,796, Cl. 360-51.000.

Deisenroth, Norbert F.; Nordhaus, John P.; and Siegelman, Abe, to

Elematic Instrument Corporation. Flowmeter. 4,064,751, Cl. 73-207.000.

Delaney, Edward A.; Pinkowski, Norman J.; and Nudenberg, Walter, to Uniroyal, Inc. Graft copolymer on butadiene-piperylene elastomer. 4,065,444, Cl. 260-880.00R.

Delignieres, Robert, to Institut Francais du Petrole. Doppler navigation method for determining the distance travelled by a vehicle. 4,065,744, Cl. 340-3.00D.

Della Penna, Gino: *See*—
Cecere, Francesco; Galli, Giuliano; Della Penna, Gino; and Rappuoli, Bruno, 4,065,353, Cl. 195-2.000.

Del Pino, Fernando: *See*—
Steinstrasser, Rolf; and Del Pino, Fernando, 4,065,489, Cl. 560-59.000.

Delta and Pine Land Company of Mississippi: *See*—
Downing, James D., 4,064,636, Cl. 34-60.000.

Delzenne, Gerard Albert: *See*—
Laridon, Urbain Leopold; Delzenne, Gerard Albert; Mader, Helmut; Ulrich, Hans; and Seidel, Bernhard, 4,065,524, Cl. 260-895.000.

DeMajistre, Robert: *See*—
Prucnal, Paul J.; and DeMajistre, Robert, 4,065,624, Cl. 428-522.000.

den Broeder, Steven E.: *See*—
Soonawala, Homi D.; and den Broeder, Steven E., 4,065,379, Cl. 208-67.000.

Denny, George H.; and Saari, Walfred S., to Merck & Co., Inc. Process for the preparation of substituted trichloroacetamidine derivatives. 4,065,464, Cl. 260-326.150.

Denny, George H., to Merck & Co., Inc. Process for the preparation of substituted trichloroacetamidine derivatives. 4,065,465, Cl. 260-326.150.

de Nora, Vittorio, to Oronzio de Nora Impianti Elettrochimici, S.p.A. Method of operating an electrolysis cell. 4,065,367, Cl. 204-98.000.

Denzer, Richard E., to General Motors Corporation. Cambering device for cambering vehicle. 4,065,146, Cl. 280-278.000.

Depew, Walter L. Solar actuated boiler and appurtenances. 4,064,865, Cl. 126-271.000.

Derrick, H. William, Jr., to Derrick Manufacturing Corporation. Multiple screen apparatus. 4,065,382, Cl. 209-313.000.

Derrick Manufacturing Corporation: *See*—
Derrick, H. William, Jr., 4,065,382, Cl. 209-313.000.

Design & Funding, Inc.: *See*—
Simms, John E., 4,064,613, Cl. 29-407.000.

Desmarais, Armand Joseph, to Hercules Incorporated. Tile cements. 4,065,319, Cl. 106-93.000.

Detroit, William John; and Sanford, Michael Elliot, to American Can Company. Well cementing. 4,065,318, Cl. 106-90.000.

Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See*—
Schreyer, Gerd; Tanner, Herbert; Weigert, Wolfgang; and Gora, Ullrich, 4,065,510, Cl. 260-632.00B.

Deutsche Texaco Aktiengesellschaft: *See*—
Rietsch, Eike, 4,065,665, Cl. 364-487.000.

DeVries, Adrian J., to Zenith Radio Corporation. Surface wave device for use in a ghost cancellation system. 4,065,789, Cl. 358-167.000.

Dexion-Comino International Limited: *See*—
Hewett, Alan R.; and Robilliard, Leonard T., 4,064,813, Cl. 108-60.000.

Diamond Shamrock Corporation: *See*—
Whyte, Andrew; Gallup, William A.; Schenker, Barry A.; and Schulz, Robert A., 4,065,376, Cl. 204-263.000.

Diaz, Nelson Ramon, to Honeywell Information Systems Inc. Apparatus for cutting and forming flexible beam leads of an integrated circuit chip. 4,064,917, Cl. 140-105.000.

Dickerson, George E., to United States of America, National Aeronautics and Space Administration. Composite lamination method. 4,065,340, Cl. 156-154.000.

Dickey, Charles R.; and Voorhees, Vanderveer, to Bray Oil Co. Magnesium oxide process. 4,065,396, Cl. 252-33.400.

Dickey, John W.; and Babb, Larry F., to Emerson Electric Co. Device for facilitating the bending and forming of plastic pipe or other structures. 4,065,242, Cl. 425-384.000.

Dickinson, William B., to Sterling Drug Inc. N-(4-Amino-2-butynyl)imides. 4,065,471, Cl. 260-326.00N.

Diebel, Howard, to Moyer Diebel Limited. Vent structure for dishwashers. 4,064,888, Cl. 134-182.000.

Dietzgen Corporation: *See*—
Schuman, Gordon A., 4,064,933, Cl. 165-89.000.

Dilg, Walter C.; and Glauser, Wilbert G., to Dresser Industries, Inc. Railway coupler and draft rigging. 4,064,998, Cl. 213-69.000.

Ditter, Jerome F.; and Klusmann, Eugene B., to United States of America, Navy. Synthesis of β-methyl derivatives of 2,4-dicarba-closo-heptaborane-7. 4,065,509, Cl. 260-606.50B.

Divajex: *See*—
Conklin, Hale, 4,065,336, Cl. 156-69.000.

Dobashi, Harry H., to Union Oil Company of California. Methanation process with intermittent reactivation of catalyst. 4,065,484, Cl. 260-449.60M.

Dobrovolsky, Leonid Vasilievich. Device for selecting sets of rolls for twenty-high rolling mill. 4,064,728, Cl. 72-238.000.

Dr. Ing. h.c.F. Porsche AG, Firma: *See*—
Weber, Rudiger, 4,064,897, Cl. 137-224.000.

Dodson, William Carter, Jr.: *See*—
Contractor, Rashmikant Maganlal; Dodson, William Carter, Jr.; Hentges, James John; and Seppala, Earl Edwin, 4,064,597, Cl. 19-156.300.

Dolgos, Charles: *See*—
Pobuta, Walter; and Dolgos, Charles, 4,064,918, Cl. 140-123.600.

Domeshek, Sol. Method of enhancing the information legibility of multi-color graphic material. 4,065,309, Cl. 96-14.000.

Domtar Limited: *See*—
Findlay, David Michael, 4,065,504, Cl. 260-600.00R.

Dooley, J. Gordon: *See*—
Feldman, Louis I.; and Dooley, J. Gordon, 4,065,580, Cl. 426-33.000.

Doolittle, Mac R., to Clark Equipment Company. Steering mechanism. 4,064,967, Cl. 180-155.000.

Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, to Carlo Erba, S. p. A. 5:6-Benzo δ-pyrone derivatives and process for their preparation. 4,065,467, Cl. 260-345.200.

Doriath, Gerard: *See*—
Micheron, Francois; Doriath, Gerard; and Spitz, Eric, 4,065,677, Cl. 307-112.000.

Doughty, Robert L. Turntable for record disc. 4,065,135, Cl. 274-39.00R.

Douglas, James L.: *See*—
Horning, Donald E.; Morris, Leeson R.; and Douglas, James L., 4,065,622, Cl. 544-105.000.

Downing, James D., to Delta and Pine Land Company of Mississippi. Apparatus for delinting cottonseed. 4,064,636, Cl. 34-60.000.

Doyle, Terrence W.: *See*—
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., 4,065,623, Cl. 544-105.000.

Dravo Corporation: *See*—
Cappel, Fred; Hastik, Walter; Fleming, Georges; and Hofmann, Pierre, 4,065,295, Cl. 75-5.000.

Draxler, James Richard, to Brunswick Corporation. Electric starter interlock for outboard motor devices. 4,064,823, Cl. 115-17.000.

Dresser Industries, Inc.: *See*—
Dilg, Walter C.; and Glauser, Wilbert G., 4,064,998, Cl. 213-69.000.
Englert, Robert Dixon; and Armstrong, Kenneth Ronald, 4,065,526, Cl. 261-62.000.
Marquis, Gerald L., 4,064,939, Cl. 166-253.000.

Drexelbrook Controls, Inc.: *See*—
Sun, Robert J.; and Maltby, Frederick L., 4,064,753, Cl. 73-304.00C.

Dreyer, William J., to Durrum Instrument Corporation. Peptide or protein sequencing method and apparatus. 4,065,412, Cl. 260-8.000.

Dudley, George M. Mono-page paper distributor. 4,065,118, Cl. 271-14.000.

Dujardin, Esther; Kuiper, Ysbrand; Cremer, Rene; and Sironval, Cyrille. Fixing and retrieving recorded information produced by means of photosensitive material of biological origin. 4,065,310, Cl. 96-27.00R.

Dumas, Bernard Roger: *See*—
Lorson, Pierre Michel; and Dumas, Bernard Roger, 4,065,332, Cl. 149-19.900.

Dumitrescu, Ioan Florin; Cojocaru, Constantin; and Bolintineanu, Constantin, to Centrul de Protectia si Igiena Muncii. Method and device for evaluating nerve impulse propagation velocity and latency of electrodermal reflexes. 4,064,870, Cl. 128-2.00N.

Dunbar, Jack E.: *See*—
Cramer, Robert L.; Dunbar, Jack E.; and Mientus, James A., 4,064,875, Cl. 128-142.200.

Duncan, Eugene G.; and Spaniola, James W., to General Motors Corporation. Low tire pressure warning circuit for a tractor/trailer combination. 4,065,750, Cl. 340-58.000.

Dunn, John G.: *See*—
Wong, James Y.; Kashyap, Satish C.; and Dunn, John G., 4,065,655, Cl. 219-10.55D.

Dunn, William M., to TRW Inc. Method for making multi-layer capacitors. 4,064,606, Cl. 29-25.420.

Du Pont de Nemours, E. I., and Company: *See*—
Contractor, Rashmikant Maganlal; Dodson, William Carter, Jr.; Hentges, James John; and Seppala, Earl Edwin, 4,064,597, Cl. 19-156.300.
Frazer, August Henry, 4,065,431, Cl. 260-47.00C.
Frazer, August Henry, 4,065,432, Cl. 260-47.00C.
Jackson, Harold Leonard, 4,065,259, Cl. 8-166.000.
Logothetis, Anestis Leonidas, 4,065,613, Cl. 526-292.000.
May, Ralph Forrest, 4,065,525, Cl. 260-989.000.
Sayre, James Franklin; and Smale, Karl Harvey, 4,064,712, Cl. 66-192.000.
Thorpe, John Anton; and Porter, Harold Felton, 4,065,486, Cl. 260-465.300.

Durmann, George J. Apparatus for spraying heat responsive materials. 4,065,057, Cl. 239-79.000.

Durrum Instrument Corporation: *See*—
Dreyer, William J., 4,065,412, Cl. 260-8.000.

Dussault, Jean G. M.; Geckle, Robert A.; and Puskas, William L., to Branson Ultrasonics Corporation. Apparatus for cleaning workpieces by ultrasonic energy. 4,064,885, Cl. 134-58.00R.

Dybas, Richard A.: *See*—
Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,065,497, Cl. 260-563.00P.

Dyck, George J., to Canadian Patents and Development Limited. Vehicle weighing scale. 4,064,955, Cl. 177-134.000.

Dynachem Corporation: *See*—
Yamazaki, Toshio; Cook, Harriet J.; and Lipson, Melvin A., 4,065,315, Cl. 96-48.0QP.

Dynetics, Inc.: *See—*
Crankshaw, John H., 4,064,979, Cl. 192-53.00F.
E. F. Johnson Company: *See—*
Wahi, Chander M., 4,065,201, Cl. 339-103.00R.
E. R. Squibb & Sons, Inc.: *See—*
Hauck, Frederic P.; and Reid, Joyce, 4,065,485, Cl. 260-464.000.
Krapcho, John; and Turk, Chester F., 4,065,617, Cl. 542-450.000.
Narayanan, Venkatachala L.; Gadebusch, Hans H.; and Haugwitz, Rudiger D., 4,065,563, Cl. 424-272.000.
Earhart, John E.; Lachenmaier, Frank D.; and McConnell, John E., to General Motors Corporation. Electrical coil assembly. 4,065,740, Cl. 336-136.000.
Eastman Kodak Company: *See—*
Harvey, Donald Malcolm, 4,065,778, Cl. 354-25.000.
Jaskowsky, Jorg, 4,065,661, Cl. 364-464.000.
Pond, David M.; Wang, Richard H. S.; and Irick, Gether, Jr., 4,065,427, Cl. 260-45.8NT.
Shippey, Frederick Lee, 4,065,313, Cl. 96-60.0BF.
Zielinski, Erich, 4,065,042, Cl. 226-92.000.
Eaton Corporation: *See—*
Bart, Hansueli, 4,064,845, Cl. 123-32.00G.
German, Dale F.; and Nidle, Charles, 4,064,923, Cl. 152-427.000.
Tinholt, Thomas H., 4,064,980, Cl. 192-58.00B.
Walsh, Michael M., 4,065,100, Cl. 254-167.000.
Eaton Yale Ltd.: *See—*
Wildey, Allan J., 4,064,956, Cl. 180-24.050.
Eberhardt, H. Alfred, to Hale Fire Pump Company. Plural fluid proportioning apparatus. 4,064,891, Cl. 137-98.000.
Eberhart, James G.: *See—*
Roche, Michael F.; Faist, Suzan M.; Eberhart, James G.; and Ross, Laurids E., 4,065,602, Cl. 429-72.000.
Ebner, Walter B.; and Walk, Charles Richard, to United States of America, Army. Process for preparing lithium hexafluoroarsenate of high purity. 4,065,550, Cl. 423-464.000.
Echols, Marvin C.; and Gruller, David L., to Zap-Lok Systems International, Inc. Method of joining plastic coated pipe. 4,064,619, Cl. 29-458.000.
Echte, Adolf: *See—*
Wild, Hans; Jeckel, Guenter; Echte, Adolf; Zizlsperger, Johann; Reffert, Rudi Wilhelm; and Thielen, Gunter, 4,065,532, Cl. 264-68.000.
Echterhoff, Heinz: *See—*
Gemmeke, Wilfried; Werner, Heinrich; Echterhoff, Heinz; and Raulf, Erich, 4,065,296, Cl. 75-48.000.
Ecker, Amir L.: *See—*
Edwards, Thomas C.; and Ecker, Amir L., 4,064,705, Cl. 62-2.000.
Eckstein, George R.; and Moyher, William G., to Remington Arms Company, Inc. Method of making plastic cartridge casing. 4,065,541, Cl. 264-295.000.
Eco-Control, Inc.: *See—*
Ajami, Alfred M.; Walsh, Fraser M.; and Crouse, Dennis N., 4,065,601, Cl. 429-50.000.
Ecodyne Corporation: *See—*
Flynn, George; and Salem, Eli, 4,065,388, Cl. 210-80.000.
Economopoulos, Mario: *See—*
Paulus, Philippe; and Economopoulos, Mario, 4,065,329, Cl. 148-18.000.
Eddy, Clifford O.; and Hoffend, Thomas R., to Xerox Corporation. Fixing method using polyarylsiloxanes as release agents. 4,065,586, Cl. 427-22.000.
Edge, Gordon Malcolm: *See—*
Ridler, Keith Douglas; Gosling, Alexander Bennett; and Edge, Gordon Malcolm, 4,065,188, Cl. 308-10.000.
Edmonds, Stephen: *See—*
Roberts, William C., Jr.; and Edmonds, Stephen, 4,064,821, Cl. 114-103.000.
Edwards, James T., II. Rate/time computer and control device. 4,065,663, Cl. 364-464.000.
Edwards, Thomas C.; and Ecker, Amir L., to Rovac Corporation, The. Air conditioning system having compressor-expander in pressurized closed loop system with solar assist and thermal storage. 4,064,705, Cl. 62-2.000.
Effbe-Werk Fritz Brumme & Co. KG: *See—*
Weisenberger, Gottfried, 4,064,910, Cl. 137-627.500.
Egan, Michael F. High-bounce amusement and exercise air bag. 4,065,124, Cl. 272-65.000.
Eguchi, Seiji: *See—*
Suzuki, Seigo; and Eguchi, Seiji, 4,065,639, Cl. 178-69.100.
Egyt Gyogyszervegyeszeti Gyar: *See—*
Rakoczi, Jozsef; Beck, Ivan; Kiss, Csaba; Horvath, Imre; and Nemes, Miklos, 4,065,450, Cl. 260-239.00B.
Ehama, Mituo: *See—*
Abe, Fumiyuki; Ikawa, Kazuo; Ehama, Mituo; and Ogawa, Naoki, 4,065,157, Cl. 280-751.000.
Eichelberger, Charles W.: *See—*
Butler, Walter J.; and Eichelberger, Charles W., 4,065,766, Cl. 340-347.0AD.
Eikosha Co., Ltd.: *See—*
Fukada, Rokuro, 4,065,261, Cl. 21-74.00R.
Eiland, P. Frank: *See—*
Spanel, Abram N.; Eiland, P. Frank; and Jacobs, David R., 4,064,816, Cl. 112-79.00A.
Eissler, John C., to Crown Cork & Seal Company, Inc. Pouring fitment for metal topped container. 4,065,035, Cl. 222-153.000.
Eklund, John Folke; and Svensson, Sven-Hakan, to AB Bofors. Magazine for a mobile firearm. 4,064,787, Cl. 89-34.000.
El-Jay, Inc.: *See—*
Johnson, Louis W., 4,065,063, Cl. 241-275.000.
Elders, Gerald W. Point-attack bit. 4,065,185, Cl. 299-86.000.
Elders, Marius J. A.; Vink, Nicolaas G.; and van Steen, Cornelis, to U.S. Philips Corporation. Deflection coil unit comprising toroidally wound coils for a color television display tube. 4,065,738, Cl. 335-213.000.
Electric Machinery Mfg. Company: *See—*
Schlicher, David W.; and Fabian, Liboslav, 4,065,703, Cl. 318-176.000.
Elematic Instrument Corporation: *See—*
Deisenroth, Norbert F.; Nordhaus, John P.; and Siegelman, Abe, 4,064,751, Cl. 73-207.000.
Eli Lilly and Company: *See—*
Beck, James Richard; and Gajewski, Robert Peter, 4,065,463, Cl. 260-307.00A.
Froyd, James D., 4,065,559, Cl. 424-229.000.
Spitzer, Wayne Alfred, 4,065,618, Cl. 544-16.000.
Spitzer, Wayne Alfred, 4,065,621, Cl. 544-30.000.
Taylor, Harold Mellon, 4,065,290, Cl. 71-94.000.
Webber, John Alan, 4,065,620, Cl. 544-16.000.
Elias, Jack, to Honeywell Inc. Battery backup for AC powered DC supply. 4,065,676, Cl. 307-66.000.
Elkem-Spigerverket A/S: *See—*
Dahl, Erik Qvale, 4,065,551, Cl. 423-483.000.
Elwin, Tore, to AB Bofors. Method and device for automatic ammunition handling. 4,064,786, Cl. 89-33.00B.
Emerson Electric Co.: *See—*
Dickey, John W.; and Babb, Larry F., 4,065,242, Cl. 425-384.000.
Pauli, Jude A., 4,064,826, Cl. 116-117.00C.
Emery Industries, Inc.: *See—*
Foulks, Harold C., Jr.; Rodenberg, Herbert G.; and Mains, Harold E., 4,065,418, Cl. 260-23.0XA.
Emig, Peter; Pohle, Hans; Scheffler, Gerhard; Brock, Norbert; Lenke, Hans-Dieter; and Pohl, Jorg, to Asta-Werke Aktiengesellschaft. Basic enol ether and acid addition salts thereof. 4,065,501, Cl. 260-570.600.
Enders, Edgar: *See—*
Fest, Christa; Enders, Edgar; Eue, Ludwig; and Schmidt, Robert R., 4,065,292, Cl. 71-99.000.
Endo, Eiji: *See—*
Oda, Yoshio; Suhara, Manabu; and Endo, Eiji, 4,065,366, Cl. 204-98.000.
Endo Laboratories, Inc.: *See—*
Finizio, Michael, 4,065,453, Cl. 424-248.560.
Endres, Thomas E.; and Rodeman, Donald W., to General Motors Corporation. Tuned radio frequency amplifier with back to back varactor diodes connected through a common cathode lead. 4,065,723, Cl. 330-302.000.
Engelhardt, Edward L.: *See—*
Atkinson, Joseph George; Rooney, Clarence Stanley; Girard, Yves; and Engelhardt, Edward L., 4,065,572, Cl. 424-273.00R.
Engert, David Michael: *See—*
Martin, Richard Thomas, Jr.; and Engert, David Michael, 4,065,131, Cl. 273-134.00B.
Englert, Robert Dixon; and Armstrong, Kenneth Ronald, to Dresser Industries, Inc. Fuel introduction device for internal combustion engine. 4,065,526, Cl. 261-62.000.
Enomoto, Hiroshi: *See—*
Ohata, Katsuya; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, 4,065,562, Cl. 424-267.000.
Entzmann, Karl. Process for the production of cement clinker from fuel shale. 4,065,321, Cl. 106-106.000.
Ericson, Alvin E.: *See—*
Walitalo, Charles R.; and Ericson, Alvin E., 4,064,776, Cl. 83-171.000.
Erni, Bruno; and Meister, Pierre-Andre, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Keyboard switch assembly having flexible rung ladder contacts. 4,065,651, Cl. 200-5.00A.
Ernst, Arnold E. Spring trip mechanism. 4,064,946, Cl. 172-710.000.
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; Burkl, Erich; and Kiener, Heinz, to SKF Industrial Trading and Development Company, B.V. Thrust ball bearing. 4,065,193, Cl. 308-233.000.
Ess, John O., to United States of America, Navy. Pressure-balanced underwater structural release system. 4,064,783, Cl. 85-33.000.
Estes, John H.: *See—*
Bartley, Burton H.; and Estes, John H., 4,065,514, Cl. 260-676.00R.
Etat Francais represente par le Delegue Ministeriel pour l'Armement: *See—*
Maguer, Pierre; and Verveur, Jean, 4,065,748, Cl. 340-9.000.
Ethyl Corporation: *See—*
Kao, James T. F., 4,065,546, Cl. 423-300.000.
Malec, Robert E., 4,065,499, Cl. 260-567.60M.
Eue, Ludwig: *See—*
Fest, Christa; Enders, Edgar; Eue, Ludwig; and Schmidt, Robert R., 4,065,292, Cl. 71-99.000.
Hofer, Wolfgang; Schliebs, Reinhard; Schmidt, Robert; and Eue, Ludwig, 4,065,288, Cl. 71-76.000.
Evans Products Company: *See—*
Ridenour, Michael R., 4,065,052, Cl. 236-86.000.
Evans, Ronald C., to McIntosh Laboratory, Inc. Logarithmic converter. 4,065,682, Cl. 307-261.000.
Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and

Schmitt, Frederick Louis, to International Flavors & Fragrances Inc. α-Oxy(oxo) sulfide perfume and cologne compositions. 4,065,408, Cl. 252-522.000.

Evjen, Clarence E.: *See—*
Christenson, Roger M.; and Evjen, Clarence E., 4,065,415, Cl. 260-17.4SG.
Christenson, Roger M.; and Evjen, Clarence E., 4,065,416, Cl. 260-17.4SG.

Evkin, Ivan Frolovich; Petrov, Vladimir Alexandrovich; Olevsky, Viktor Markovich; Ruchinsky, Vitaly Rafael-Abovich; Bushev, Vladimir Semenovich; and Tatyanchikov, Valentin Alexeevich. Roter thin-film evaporator. 4,065,346, Cl. 159-6.00R.

Ex-Cell-O Corporation: *See—*
Wunder, William G., 4,064,928, Cl. 164-264.000.

Exxon Research and Engineering Company: *See—*
Hulme, Roger, 4,065,405, Cl. 252-415.000.
Moser, John F., Jr.; and Behrmann, William C., 4,065,516, Cl. 260-683.470.
Say, Geoffrey R.; Baird, William C., Jr.; and Kamienski, Paul W., 4,065,381, Cl. 208-134.000.
Van Auken, Richard L., 4,065,150, Cl. 280-610.000.

Ezekoye, Levi Ike. Multi-position multi-purpose support and storage structure. 4,064,580, Cl. 5-327.00B.

Fabian, Frank-Dietrich; and Leucht, Rainer, to Daimler-Benz Aktiengesellschaft. Front section of a motor vehicle, especially of a passenger motor vehicle. 4,065,170, Cl. 296-37.100.

Fabian, Liboslav: *See—*
Schlicher, David W.; and Fabian, Liboslav, 4,065,703, Cl. 318-176.000.

Fagan, William J. Golf club grip attachment. 4,065,127, Cl. 273-81.00D.

Fahmie, John H. Collapsible dog feeder. 4,065,195, Cl. 312-258.000.

Fahrni, Peter: *See—*
Hostettler, Werner, 4,065,003, Cl. 214-16.600.

Faid, Robert W.; and Reinhart, William F., to W. R. Grace & Co. Post-applied waterstop connection. 4,064,672, Cl. 52-726.000.

Fairclough, Roy: *See—*
Jenkins, Stanley Frederick Noel; Fairclough, Roy; Howard, Brian Arthur; and Miley, Frederick, 4,065,078, Cl. 244-104.0FP.

Faist, Suzan M.: *See—*
Roche, Michael F.; Faist, Suzan M.; Eberhart, James G.; and Ross, Laurids E., 4,065,602. Cl. 429-72.000.

Fals, Henry J., to Raymond Lee Organization, Inc., The, a part interest. Guitar pick. 4,064,781, Cl. 84-322.000.

Farabaugh, Patrick, to Sybron Corporation. Fluid distributor. 4,065,391, Cl. 210-274.000.

Farber, Milton; Loveless, Frederick C.; and Peterson, Robert F., Jr., to Uniroyal, Inc. Puncture sealing composition and tire. 4,064,922, Cl. 152-347.000.

Farrell, James L.: *See—*
Hill, David A.; Pearson, Durk J.; Motley, Ethelyn P.; Beard, Thomas N.; and Farrell, James L., 4,065,183, Cl. 299-4.000.

Farrissey, William J., Jr.: *See—*
Andrews, Philip S.; Farrissey, William J., Jr.; Onder, Besir K.; and Tilley, James N., 4,065,441, Cl. 260-78.00R.

Fasciati, Alfred: *See—*
Buhler, Arthur; Fasciati, Alfred; and Schlumpf, Karl, 4,065,254, Cl. 8-1.00C.

Fast, Clarence R., to Standard Oil Company (Indiana). Well screen with erosion protection walls. 4,064,938, Cl. 166-236.000.

Fastner, Thorwald; Niedermayr, Alois; Nakesch, Johann; and Turmer, Max, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Continuous casting method and apparatus. 4,064,925, Cl. 164-66.000.

fea Devices, Inc.: *See—*
Feldon, Arthur, 4,065,760, Cl. 340-244.00R.

Federau, Heinz: *See—*
Brendel, Hugo; and Federau, Heinz, 4,065,245, Cl. 425-503.000.

Fehrenbach, Siegfried; and Feuerbacher, Alfred, to Robert Bosch GmbH. Air valve for a fuel injection system. 4,064,854, Cl. 123-139.0AW.

Feldman, Louis I.; and Dooley, J. Gordon, to GB Fermentation Industries, Inc. Lipolytic enzyme flavoring system. 4,065,580, Cl. 426-33.000.

Feldon, Arthur, to fea Devices, Inc. Liquid level sensor. 4,065,760, Cl. 340-244.00R.

Ferranti Limited: *See—*
Wright, David Allan, 4,065,113, Cl. 267-156.000.

Fest, Christa; Enders, Edgar; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal agents. 4,065,292, Cl. 71-99.000.

Feuerbacher, Alfred: *See—*
Fehrenbach, Siegfried; and Feuerbacher, Alfred, 4,064,854, Cl. 123-139.0AW.

Feuersanger, Alfred E.: *See—*
Haugsjaa, Paul O.; and Feuersanger, Alfred E., 4,065,701, Cl. 315-248.000.

Fiat-Allis Construction Machinery, Inc.: *See—*
Boersma, Richard F., 4,064,767, Cl. 74-491.000.

Fibron, Inc.: *See—*
Gustafson, Kenneth C.; and Chastain, Edward L., 4,065,538, Cl. 264-154.000.

Fields, Ellis K.; Zimmerschied, Wilford J.; and Palmer, David A., to Standard Oil Company. Pyrolysis compositions from silver salts of polycarboxylic acids. 4,065,442, Cl. 260-78.410.

Figueres, Roger: *See—*
Quehen, Andre; and Figueres, Roger, 4,064,929, Cl. 164-433.000.

Filderman, Rene, to Societe Anonyme Francaise du Ferodo. Actuator mounting assembly for a multi-disc brake. 4,064,974, Cl. 188-71.300.

Filderman, Rene Gabriel, to Societe Anonyme Francaise du Ferodo. Laminated noise-preventing support for the friction lining of a brake shoe. 4,064,975, Cl. 188-73.500.

Findlay, David Michael, to Domtar Limited. Process for the methylation of hydroxybenzene derivatives. 4,065,504, Cl. 260-600.00R.

Finizio, Michael, to Endo Laboratories, Inc. Levorotatory molindone and the use as an antidepressant. 4,065,453, Cl. 424-248.560.

Fiocca, Louis L., to Advanced Instrument Development, Inc. Rotor controller systems for X-ray tubes. 4,065,673, Cl. 250-402.000.

Firestone Tire & Rubber Company, The: *See—*
Pilarski, Regis V.; and Yates, Gerald A., 4,065,070, Cl. 242-107.40A.

Flanagan, John J., to Corporate Brands, Inc. Hard surface detergent composition. 4,065,409, Cl. 252-528.000.

Fleigle, Donald Earl, to Black and Decker Manufacturing Company, The. Cordless twin blade lawnmower construction. 4,064,680, Cl. 56-11.900.

Fleischman, Andor A., to Bell & Howell Company. Short focal length optical system with large aperture. 4,065,205, Cl. 350-216.000.

Fleming, Georges: *See—*
Cappel, Fred; Hestik, Walter; Fleming, Georges; and Hofmann, Pierre, 4,065,295, Cl. 75-5.000.

Fletcher, James C.; Miller, Charles G.; and Stephens, James B. Low cost solar energy collection system. 4,065,053, Cl. 237-1.00A.

Flexible Steel Lacing Company: *See—*
Pray, Winston C., 4,063,045, Cl. 227-147.000.

Florida Machine of Boca Raton: *See—*
Caron, Marshall J., 4,064,586, Cl. 15-1.700.

Flynn, George; and Salem, Eli, to Ecodyne Corporation. Process for removal of undissolved impurities from ion exchange resin. 4,065,388, Cl. 210-80.000.

Foddis, Antonio. Universal eye pressure impulse tonometer and method of measuring the intra-ocular pressure. 4,064,743, Cl. 73-80.000.

Fontana, Frank J., to Stewart-Warner Corporation. Chair control. 4,065,176, Cl. 297-304.000.

Force, John B.: *See—*
Stewart, John A.; Hynes, Roy G.; Beyerlein, David G.; and Force, John B., 4,065,751, Cl. 340-58.000.

Ford Motor Company: *See—*
Bradley, John E., 4,064,695, Cl. 60-517.000.
Labana, Santokh S.; and Theodore, Ares N., 4,065,518, Cl. 260-836.000.

Forde, Louis. Ignition system with multiplex distributor for engines. 4,064,858, Cl. 123-148.0DS.

Forlani, Al. Bacon cooking device. 4,064,797, Cl. 99-341.000.

Forsberg, Karl Sievert: *See—*
Lundkvist, Bror Ludvig; Lindeberg, Sven-Erik; and Forsberg, Karl Sievert, 4,065,652, Cl. 200-175.000.

Foster, Tom: *See—*
Johnson, James Edward; Foster, Tom; and Allan, Roy Duncan, 4,064,692, Cl. 60-261.000.

Foulks, Harold C., Jr.; Rodenberg, Herbert G.; and Mains, Harold E., to Emery Industries, Inc. High molecular weight esters of α-alkyl branched monocarboxylic acids. 4,065,418, Cl. 260-23.0XA.

Foundation: The Research Institute of Electric and Magnetic Alloys, The: *See—*
Masumoto, Hakaru; and Murakami, Yuetsu, 4,065,330, Cl. 148-31.550.

Fox, John F., to Atlanta Metal Products, Inc. Machine for progressively closing flanges of cap strips on standing T-rib roofs. 4,064,819, Cl. 113-55.000.

Fox Valley Corporation: *See—*
Bennett, Walter E., 4,064,990, Cl. 206-494.000.

France, Haywood Gordon, to Union Carbide Corporation. Process for dry cleaning leather. 4,065,258, Cl. 8-142.000.

Francis, John R., to Glenayre Electronics, Ltd. Demodulation method and circuit for discretely modulated ac signals. 4,065,722, Cl. 329-105.000.

Frank, Alan I W, to Alan I W Frank Corporation, The. Apparatus for molding polymeric materials. 4,065,244, Cl. 425-412.000.

Frank W. Murphy Manufacturer, Inc.: *See—*
Murphy, Frank W., Jr.; and Sparks, Buddy G., 4,064,752, Cl. 73-302.000.

Frantz, Virgil L.; and Taylor, Thomas D., to Graham-White Sales Corporation; and Graham-White Manufacturing Co. Solenoid-actuated valve. 4,065,096, Cl. 251-137.000.

Franz, Helmut, to PPG Industries, Inc. Gold-appearing films of copper, nickel and copper oxide layers. 4,065,626, Cl. 428-629.000.

Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,064,807, Cl. 104-7.00A.

Frazer, August Henry, to Du Pont de Nemours, E. I., and Company. Thermally stable, rigid polyesters from aromatic dibasic acids and thermally stable, rigid diols. 4,065,431, Cl. 260-47.00C.

Frazer, August Henry, to Du Pont de Nemours, E. I., and Company. Thermally stable, rigid polyesters from aromatic dibasic acids and thermally stable, rigid bisphenols. 4,065,432, Cl. 260-47.00C.

Frazier, Donald; and Hardin, John R., Jr. Cantilever rack construction. 4,065,089, Cl. 248-245.000.

Freiburger, Thomas M.: *See—*
Boyd, H. Edward; and Freiburger, Thomas M., 4,064,772, Cl. 81-57.130.

French, Eddie C.: *See—*
Martin, Richard L.; and French, Eddie C., 4,065,373, Cl. 204-195.00C.

Freudenschuss, Otto, to Vockenhuber, Karl; and Hauser, Raimund. Cassette rewind stop control for a movie camera. 4,065,209, Cl. 352-72.000.

Frey, Christoph; and von der Crone, Jost, to Ciba-Geigy Corporation. Iminoisoindolinone metal complex. 4,065,462, Cl. 260-299.000.

Frey, Markus, to ITO-Patent AG. Method for measuring the filling level in containers and apparatus for performing the method. 4,064,754, Cl. 73-313.000.

Friedman, Henry C.: *See—*
Mazie, Lowell I.; Friedman, Henry C.; Getzler, Nathaniel; and Grollman, Jack D., 4,064,988, Cl. 206-44.00R.

Friedrichs, Hans-Otto, to Herman Hemscheidt Maschinenfabrik. Hydraulic shield assembly. 4,064,701, Cl. 61-45.00D.

Friello, Dominick R.: *See—*
Reggio, Richard A.; Friello, Dominick R.; and Beam, John E., 4,065,578, Cl. 426-3.000.

Friese, Karl-Hermann: *See—*
Hacker, Wolf-Dieter; Friese, Karl-Hermann; Steinke, Leo; and Weyl, Helmut, 4,065,372, Cl. 204-195.00S.

Frommer, Werner; Gericke, Horst; Keup, Uwe; Puls, Walter; Schmidt, Delt; and Wagner, Otto, to Bayer Aktiengesellschaft. Amino sugars and their use in improving the meat:fat ratio in animals. 4,065,557, Cl. 424-181.000.

Fromson, Howard A. Process for anodizing aluminum. 4,065,364, Cl. 204-15.000.

Froyd, James D., to Eli Lilly and Company. Dinitroanilines for control of soil-borne phytopathogens. 4,065,559, Cl. 424-229.000.

Fry, Eric, to Jonathan Lock Limited. Cylinder lock mechanisms. 4,064,720, Cl. 70-363.000.

Frye, George Joseph; and Geerling, Leonardus Johannes. Automatic acoustical testing system. 4,065,647, Cl. 179-175.10A.

Fuel Injection Development Corporation: *See—*
Leshner, Ervin; and Leshner, Michael D., 4,064,748, Cl. 73-117.300.

Fugono, Takeshi: *See—*
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; and Minami, Isao, 4,065,619, Cl. 544-25.000.

Fuji Photo Film Co., Ltd.: *See—*
Sakaguchi, Shinji; Imai, Shinichi; Yamaguchi, Junn; and Tsuji, Nobuo, 4,065,435, Cl. 260-47.0UP.
Satomura, Masato, 4,065,430, Cl. 260-47.0UA.
Sugisaki, Tsutomu; and Watanabe, Hideomi, 4,065,798, Cl. 360-128.000.
Takahashi, Yutaka; Hakamata, Yoshio; and Konno, Masamitu, 4,064,677, Cl. 53-123.000.

Fujii, Noboru: *See—*
Kubota, Katsuyuki; Fujii, Noboru; Yamada, Kouichi; Nakamura, Kimikazu; and Yuuki, Norihito, 4,064,616, Cl. 29-429.000.

Fujitsu Limited: *See—*
Owaki, Kenichi; Ando, Shizuo; and Nakayama, Norihiko, 4,065,698, Cl. 313-489.000.

Fukada, Rokuro, to Eikosha Co., Ltd. Device for emitting volatile substance. 4,065,261, Cl. 21-74.00R.

Fukuda, Mitsuo: *See—*
Kawai, Shoji; Nishimura, Kenichi; and Fukuda, Mitsuo, 4,065,358, Cl. 195-127.000.

Fulenwider, Hal, Jr. Microwave energy apparatus and method for internal combustion engines. 4,064,852, Cl. 123-119.00E.

Fuller Company: *See—*
Anthony, James, 4,065,064, Cl. 241-299.000.

Fumio, Yamazaki: *See—*
Yoshiyuki, Honma; and Fumio, Yamazaki, 4,065,234, Cl. 417-420.000.

Funahashi, Takaji. Rotary stamp. 4,064,802, Cl. 101-327.000.

Funakoshi, Kouzi: *See—*
Mizukawa, Takumi; Nakamura, Masatatsu; Funakoshi, Kouzi; and Kominami, Hideyuki, 4,065,802, Cl. 361-18.000.

Funkhouser, James Harold. Upper boat deck. 4,064,584, Cl. 9-1.100.

Furlong, Donn Breen; and Londahl, Dickey Steele, to Tuthill Pump Company. Gear pump. 4,065,235, Cl. 417-420.000.

Furukawa Electric Co. Ltd., The: *See—*
Shii, Hikaru; and Oda, Eisuke, 4,065,594, Cl. 428-113.000.

Furuta, Sachiko: *See—*
Nishiumi, Shiro; Hasegawa, Shoichi; Mizoguchi, Toshiyuki; and Furuta, Sachiko, 4,065,599, Cl. 428-402.000.

Gabriel, Gerhard: *See—*
Beck, Heinz; Gabriel, Gerhard; and Poppel, Gunter, 4,065,608, Cl. 526-49.000.

Gabriele, Leonard A.: *See—*
Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., 4,065,222, Cl. 407-18.000.

Gaddum, Friedbert. Method of providing representation of aging of material. 4,064,745, Cl. 73-91.000.

Gadebusch, Hans H.: *See—*
Narayanan, Venkatachala L.; Gadebusch, Hans H.; and Haugwitz, Rudiger D., 4,065,563, Cl. 424-272.000.

Gaetjen, John Richard: *See—*
Cramer, Clark Evans; Gaetjen, John Richard; Grant, Carl Henry; Nelson, Paul Eugene; and Newlin, Frank Allen, III, 4,065,810, Cl. 364-200.000.

Gajary, Antal: *See—*
Pfliegel, Todor; Seres, Jeno; Gajary, Antal; Daroczy nee Csuka, Klara; and Nagy, Lajos T., 4,065,491, Cl. 260-502.500.

Gajewski, Robert Peter: *See—*
Beck, James Richard; and Gajewski, Robert Peter, 4,065,463, Cl. 260-307.00A.

Galli, Giuliano: *See—*
Cecere, Francesco; Galli, Giuliano; Della Penna, Gino; and Rappuoli, Bruno, 4,065,353, Cl. 195-2.000.

Gallup, William A.: *See—*
Whyte, Andrew; Gallup, William A.; Schenker, Barry A.; and Schulz, Robert A., 4,065,376, Cl. 204-263.000.

Gamlen, Philip Hugh, to Imperial Chemical Industries Limited. Stabilized hypochlorous acid and hypochlorite solutions. 4,065,545, Cl. 423-265.000.

Gammon, Howard M. Filter. 4,065,392, Cl. 210-282.000.

Gannon, Charles R., to Ashland Oil, Inc. Pitch impregnated articles and process for making same. 4,065,591, Cl. 428-36.000.

Garber, Murray: *See—*
Reger, David William; Garber, Murray; and Long, Don Wesley, 4,065,466, Cl. 260-327.00M.

Garczynski, John S.; Jablanofsky, Charles C.; and Murray, Joseph P., to Peripheral Dynamics, Inc. Card reader system with improved interface. 4,065,662, Cl. 235-419.000.

Garlock Inc.: *See—*
Hunt, Raymon E., 4,064,962, Cl. 181-272.000.

Garrett Corporation, The: *See—*
House, William H.; and Pierik, Gerald A., 4,064,981, Cl. 192-141.000.

Gaspar, James T.: *See—*
Noble, Lowell; and Gaspar, James T., 4,065,370, Cl. 204-192.00N.

Gassaway, James Scott. Equipment security device. 4,065,083, Cl. 248-19.000.

Gassel, Myron Michael. Method of inducing skeletal muscle relaxation. 4,065,561, Cl. 424-263.000.

Gates Rubber Company, The: *See—*
Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, 4,064,725, Cl. 72-147.000.

Gateway Industries, Inc.: *See—*
Romanzi, Louis, Jr., 4,064,603, Cl. 24-230.00A.

Gaul, Michael F. Crypt structure. 4,064,664, Cl. 52-136.000.

Gaumer, Lee S.: *See—*
Newton, Charles L.; and Gaumer, Lee S., 4,065,278, Cl. 62-26.000.

Gawlinski, Louis S. Adjustable deck chair. 4,065,172, Cl. 297-19.000.

Gayle, Harold R.; and Wagner, Walter D., to Sun Oil Company of Pennsylvania. Break-away safety valve. 4,064,889, Cl. 137-68.00R.

GAZ-Transport: *See—*
Letourneur, Jean-Claude; and Jean, Pierre, 4,065,019, Cl. 220-9.0LG.

GB Fermentation Industries, Inc.: *See—*
Feldman, Louis I.; and Dooley, J. Gordon, 4,065,580, Cl. 426-33.000.

Geary, Carl H.: *See—*
Miller, William H., Jr.; and Geary, Carl H., 4,065,136, Cl. 277-3.000.

Gebert, Kineko. Sewing tape. 4,064,631, Cl. 33-2.00R.

Geckle, Robert A.: *See—*
Dussault, Jean G. M.; Geckle, Robert A.; and Puskas, William L., 4,064,885, Cl. 134-58.00R.

Geerling, Leonardus Johannes: *See—*
Frye, George Joseph; and Geerling, Leonardus Johannes, 4,065,647, Cl. 179-175.10A.

Geiger, Paul B.; Grunewald, Ernst; and Vallor, Ben J., to Hobart Corporation. Upper level wash arm system. 4,064,887, Cl. 134-144.000.

Gellatly, Walter L. Fire pit hanger. 4,065,085, Cl. 248-124.000.

Gellerstedt, Nils Goran Axel: *See—*
Dahlberg, Stig Erland; and Gellerstedt, Nils Goran Axel, 4,064,805, Cl. 102-35.000.

Gemmeke, Wilfried; Werner, Heinrich; Echterhoff, Heinz; and Raulf, Erich, to Verkaufsgesellschaft fur Teererzeugnisse (VfT). Process for preparing composition containing carbon and low sulfur, nitrogen and ash content. 4,065,296, Cl. 75-48.000.

General Electric Company: *See—*
Bailey, Francis M., 4,065,704, Cl. 318-237.000.
Butler, Walter J.; and Eichelberger, Charles W., 4,065,766, Cl. 340-347.0AD.
Groves, James N., 4,065,357, Cl. 195-103.50R.
Hicks, William R.; and Miller, Homer R., 4,065,705, Cl. 318-245.000.
Jones, William B., 4,065,653, Cl. 200-302.000.
Keim, Robert E., 4,065,658, Cl. 219-386.000.
Langford, John R. F., 4,065,322, Cl. 134-7.000.
Lupinski, John H.; Boldebuck, Edith M.; and Barnes, Wilson J., 4,065,420, Cl. 260-29.20N.
McVey, Charles I., 4,065,691, Cl. 313-174.000.
Nash, Dudley O., 4,064,691, Cl. 60-39.060.
Pratt, Richard D.; Proffitt, Paul F.; and Webb, George, 4,065,394, Cl. 252-8.100.
Rodgers, Douglas Noss; and Roy, Prodyot, 4,065,371, Cl. 204-195.00R.
Ruark, Bruce J.; and Shaner, Richard L., 4,065,027, Cl. 220-343.000.
Selin, Terry G., 4,065,482, Cl. 260-448.20E.

General Mills Chemicals, Inc.: *See—*
Harrison, Stuart A., 4,065,627, Cl. 560-26.000.
Lundmark, Larry D.; Melby, Allan; and Chun, Ho-ming, 4,065,422, Cl. 260-29.60E.

MacKay, Kenneth D.; and Rogier, Edgar R., 4,065,502, Cl. 260-590.00R.
Mattison, Phillip L., 4,065,455, Cl. 260-289.0XA.

General Motors Corporation: *See—*
Black, Dennis A., 4,065,229, Cl. 417-270.000.
Bodnar, Alfred D., 4,065,152, Cl. 280-668.000.
Braniff, Michael J.; and Waller, James L., 4,065,182, Cl. 297-452.000.
Carella, Richard F.; and Perry, Thomas W., 4,065,178, Cl. 297-341.000.
Denzer, Richard E., 4,065,146, Cl. 280-278.000.
Duncan, Eugene G.; and Spaniola, James W., 4,065,750, Cl. 340-58.000.
Earhart, John E.; Lachenmaier, Frank D.; and McConnell, John E., 4,065,740, Cl. 336-136.000.
Endres, Thomas E.; and Rodeman, Donald W., 4,065,723, Cl. 330-302.000.
Gunlock, Donald E.; and Manetta, John A., 4,065,181, Cl. 297-452.000.
Jaffe, James M.; and Hile, John W., 4,065,715, Cl. 324-60.0CD.
Johnston, Laird E., 4,064,652, Cl. 49-394.000.
Knape, Richard S.; and Lukas, Joseph, 4,065,058, Cl. 239-88.000.
Lo, Wayne, 4,064,621, Cl. 29-569.00L.
Magyar, Joseph J., 4,065,072, Cl. 242-107.700.
Penningroth, Herbert M.; and Guyton, James H., 4,065,719, Cl. 325-312.000.
Pogue, Russell W., Jr., 4,065,720, Cl. 325-464.000.
Rabe, Paul R., 4,065,721, Cl. 328-1.000.
Rogers, Lloyd W., Jr., 4,065,155, Cl. 280-744.000.
Stewart, John A.; Hynes, Roy G.; Beyerlein, David G.; and Force, John B., 4,065,751, Cl. 340-58.000.
Williams, Donald L.; and Baker, James T., 4,065,026, Cl. 220-304.000.
Wilson, James R.; and Wise, Jerry P., 4,065,800, Cl. 360-137.000.
Winchell, Frank J., 4,065,144, Cl. 280-771.000.
Wunderlich, Langley H., 4,064,978, Cl. 188-331.000.

General Signal Corporation: *See—*
Huffman, Jerry P.; LaForest, John P.; Petit, William A.; and Smith, James A., 4,065,081, Cl. 246-34.00R.
Neuhof, Jacob; and Scott, Robert D., 4,065,767, Cl. 340-384.00E.

Geraci, Vincent M. Board game with time indicator means. 4,065,130, Cl. 273-130.0AB.

Gergely, Alex Sandor, to Philip Morris, Inc. Jam prevention device for extrusion process. 4,065,239, Cl. 425-141.000.

Geri, Don Winston: *See—*
Inose, Fumiyuki; and Geri, Don Winston, 4,064,983, Cl. 197-1.00A.

Gericke, Horst: *See—*
Frommer, Werner; Gericke, Horst; Keup, Uwe; Puls, Walter; Schmidt, Delt; and Wagner, Otto, 4,065,557, Cl. 424-181.000.

Gerigk, Gunter; Bittner, Klaus-Jurgen; and Kostner, Armin, to Hoechst Aktiengesellschaft. Method of making sheathed stick. 4,064,673, Cl. 53-3.000.

Germain, Stanley A., to L. A. Steelcraft Products, Inc. In-post tennis net tightener. 4,065,099, Cl. 254-164.000.

German, Dale F.; and Nidle, Charles, to Eaton Corporation. Tire valve assembly. 4,064,923, Cl. 152-427.000.

Gerretz, Richard, to Mannesmann Aktiengesellschaft. Tube expander. 4,064,730, Cl. 72-393.000.

Gess, Larry C. Apparatus for producing a package. 4,064,792, Cl. 93-18.000.

Getner, Edwin S. Multi-purpose stand. 4,064,993, Cl. 211-85.000.

Getzler, Nathaniel: *See—*
Mazie, Lowell I.; Friedman, Henry C.; Getzler, Nathaniel; and Grollman, Jack D., 4,064,988, Cl. 206-44.00R.

Gezari, Walter A., to Hart Associates, Inc. Reciprocating infusion pump and directional adapter set for use therewith. 4,065,230, Cl. 417-317.000.

Giakas, William. Maze puzzle. 4,065,132, Cl. 273-153.00R.

Giers, Alfred; Holdinghausen, Paul; Schneider, Hatto; and Widmann, Friedman, to Carl Schenck AG, Firma. Method and apparatus for ascertaining and indicating the angular position of an unbalance in a rotor. 4,064,761, Cl. 73-462.000.

Gijrath, Johannes Henricus Nicolaas, to U.S. Philips Corporation. Cathode ray tube color selection electrode mount. 4,065,693, Cl. 313-406.000.

Gillespie, David L. Fibre-reinforced laminates. 4,065,597, Cl. 428-285.000.

Gilmore, David D., Jr. Anti-vandalism lock device for panic-type doors. 4,065,160, Cl. 292-92.000.

Gipson, Robert Malone, to Texaco Development Corporation. Boride catalyst for epoxidizing olefinic compounds. 4,065,476, Cl. 260-348.290.

Giraldi, PierNicola: *See—*
Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, 4,065,467, Cl. 260-345.200.

Girard, Yves: *See—*
Atkinson, Joseph George; Rooney, Clarence Stanley; Girard, Yves; and Engelhardt, Edward L., 4,065,572, Cl. 424-273.00R.

Girod, Ronald Eugene, to Bell Telephone Laboratories. Communication facility integrity checking arrangement. 4,065,643, Cl. 179-18.0AH.

Gittings, Robert S., to Gold Medal, Inc. Folding chair. 4,065,173, Cl. 297-45.000.

Glaeser, George L., Jr.: *See—*
Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 4,065,044, Cl. 226-188.000.

Glaum, Gerald Vernon: *See—*
Subramanian, Kohur Nagaraja; and Glaum, Gerald Vernon, 4,065,542, Cl. 423-35.000.

Glauser, Wilbert G.: *See—*
Dilg, Walter C.; and Glauser, Wilbert G., 4,064,998, Cl. 213-69.000.

Glaze, Stanley George, to Lucas Industries Limited. Vehicle suspension systems. 4,065,154, Cl. 280-707.000.

Glenayre Electronics, Ltd.: *See—*
Francis, John R., 4,065,722, Cl. 329-105.000.

Glifberg, Nils Bertil, to Svenska Sockerfabriks AB. Machine for removing foliage from root crops. 4,064,681, Cl. 56-121.450.

Global Marine, Inc.: *See—*
Thornburg, Russell B., 4,064,822, Cl. 114-230.000.

Gluck, Julius; and Vijayendran, Bheema Rao, to Pitney-Bowes, Inc. Toner density controller. 4,064,833, Cl. 118-646.000.

Glyco-Metallwerke Daelen & Loos GmbH: *See—*
Sauer, Friedrich; and Muller, Klaus, 4,065,378, Cl. 204-297.00W.

Godard, Pierre; and Lapuyade, Robert Henri, to Societe des Accumulateurs Fixes et de Traction. Rapid charging system and method for sealed storage cells. 4,065,712, Cl. 320-39.000.

Godbout, Antonin: *See—*
Lavertu, Roger R.; and Godbout, Antonin, 4,065,529, Cl. 264-3.00E.

Goell, James E.; and Brandt, H. David, to International Telephone and Telegraph Corporation. Couplers for electro-optical elements. 4,065,203, Cl. 350-96.00C.

Goell, James E.: *See—*
Kao, Charles K.; Goell, James E.; and Maklad, Mokhtar S., 4,065,280, Cl. 65-3.00A.

Goffe, William L., to Xerox Corporation. Imaged agglomerable element and process of imaging. 4,065,307, Cl. 96-1.50R.

Gold Medal, Inc.: *See—*
Gittings, Robert S., 4,065,173, Cl. 297-45.000.

Gold, Roy Charles, to British Petroleum Company Limited, The. Flow monitoring devices. 4,065,675, Cl. 250-576.000.

Goldberg, Leslie Louis. Check digit generation and verification apparatus. 4,065,752, Cl. 340-146.1AJ.

Golden, Edward J.: *See—*
Sliwa, Robert A.; and Golden, Edward J., 4,065,709, Cl. 320-1.000.

Golden, Joseph A.: *See—*
Zavitsanos, Peter D.; Golden, Joseph A.; and Alyea, Frederick N., 4,065,207, Cl. 350-312.000.

Golz, Hans-Joachim: *See—*
Lindenberg, Hans-Georg; Illmann, Joachim; and Golz, Hans-Joachim, 4,065,116, Cl. 269-22.000.

Gomori, Alexandre. Electronic table soccer game. 4,065,128, Cl. 273-85.00D.

Goodfriend, Harvey J.: *See—*
Rackliffe, Richard J.; Goodfriend, Harvey J.; and Armstrong, Lee R., 4,064,747, Cl. 73-116.000.

Goodspeed, Raymond Frank: *See—*
Roberts, Gregory Todhunter; Owens, David Vincent; and Goodspeed, Raymond Frank, 4,065,299, Cl. 75-67.00A.

Goodyear Tire & Rubber Company, The: *See—*
Hunter, Edward E., 4,064,830, Cl. 118-57.000.

Gora, Ullrich: *See—*
Schreyer, Gerd; Tanner, Herbert; Weigert, Wolfgang; and Gora, Ullrich, 4,065,510, Cl. 260-632.00B.

Gordon, Fred Morris, to American Cyanamid Company. Soil treatment insecticide. 4,065,558, Cl. 424-216.000.

Gordos, Ambrose L. Golf club head structure. 4,065,133, Cl. 273-167.00E.

Gosling, Alexander Benett; and Mealing, Barrie Ewart, to Danfoss A/S. Brushless D.C. motor. 4,065,706, Cl. 318-254.000.

Gosling, Alexander Bennett: *See—*
Ridler, Keith Douglas; Gosling, Alexander Bennett; and Edge, Gordon Malcolm, 4,065,188, Cl. 308-10.000.

Gotchel, Joel Peter; Norton, Henry James; and Spengos, Aris C., to Scott Paper Company. Method for forming fibrous structures. 4,064,600, Cl. 19-156.300.

Gouda, Kanenari: *See—*
Kawaguchi, Yoshihiko; Harada, Yoshimi; Miki, Makoto; Gouda, Kanenari; Akiyama, Masaharu; Tokura, Masayuki; and Kuroha, Jun, 4,065,419, Cl. 260-28.50D.

Gould Inc.: *See—*
Hou, Shou L.; Dague, Leonard P.; and Agrawal, Arun K., 4,065,775, Cl. 346-140.00R.

Goulet, Donald L.: *See—*
Ruud, Alan J.; and Lewin, Ian, 4,065,667, Cl. 362-217.000.

Gover, Avraham; Samid, Ilan; and Lee, Chien-Ping, to California Institute of Technology. Monolithic PNPN injection laser optical repeater. 4,065,729, Cl. 331-94.50H.

Graber, David A. Method and apparatus for interaction of gas and liquid. 4,065,527, Cl. 261-79.00A.

Graf, Rolf: *See—*
Weckesser, Ernst; Sparwald, Volker; Reh, Lothar; Bohm, Eberhard; and Graf, Rolf, 4,065,271, Cl. 55-2.000.

Graham, Peter Charles; and Renison, Joseph Theo. Threaded connections. 4,064,785, Cl. 85-62.000.

Graham-White Manufacturing Co.: *See—*
Frantz, Virgil L.; and Taylor, Thomas D., 4,065,096, Cl. 251-137.000.

Graham-White Sales Corporation: *See*—
Frantz, Virgil L.; and Taylor, Thomas D., 4,065,096, Cl. 251-137.000.

Grant, Andrew Campbell, to Union Carbide Corporation. Porous metallic layer and formation. 4,064,914, Cl. 138-142.000.

Grant, Carl Henry: *See*—
Cramer, Clark Evans; Gaetjen, John Richard; Grant, Carl Henry; Nelson, Paul Eugene; and Newlin, Frank Allen, III, 4,065,810, Cl. 364-200.000.

Grasselli, Robert K.; Suresh, Dev D.; and Miller, Robert C., to Standard Oil Company. Manufacture of maleic anhydride from butane. 4,065,468, Cl. 260-346.750.

Grasselli, Robert K.: *See*—
Hardman, Harley F.; Callahan, James L.; and Grasselli, Robert K., 4,065,507, Cl. 260-604.00R.

Gray, Kenneth Walter; and Rees, Huw David, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Field-effect transistors. 4,065,782, Cl. 357-23.000.

Green Shield Trading Stamp Company Limited: *See*—
Wood, William, 4,064,645, Cl. 40-159.000.

Gregg, Richard G., to Pines Trailer Corporation. Trailer van construction. 4,065,168, Cl. 296-28.00M.

Greif, Francis. Underphone index. 4,064,643, Cl. 40-65.000.

Gremaud, Maurice: *See*—
Unterweger, Heinz; and Gremaud, Maurice, 4,065,805, Cl. 361-196.000.

Greten, Berndt, to Bison-werke Bahre & Greten GmbH & Co. KG. Apparatus for metering particles containing lignocellulose, such as wood chips or the like, which are to be provided with binders. 4,065,030, Cl. 222-55.000.

Grey, James S.: *See*—
Hodgson, David A.; and Grey, James S., 4,064,715, Cl. 70-18.000.

Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., to Merck & Co., Inc. Novel dibicyclo [3.1.1] and [2.2.1] heptyl and dibicyclo [3.1.1] and [2.2.1] heptenyl polyamines. 4,065,497, Cl. 260-563.00P.

Griesshammer, Rudolf: *See*—
Koppl, Franz; Griesshammer, Rudolf; and Hamster, Helmut, 4,065,533, Cl. 264-81.000.

Griffiths, William S. Helmet structure. 4,064,565, Cl. 2-412.000.

Grigorenko, Anatoly Sergeevich; Kravchenko, Vasily Savelievich; Moroz, Jury Antonovich; Kortusov, Leonid Ivanovich; and Vimba, Vladimir Ivanovich. Press. 4,064,733, Cl. 72-453.030.

Grocke, Diethelm, to Nutro Patentverwertungs-und Maschinen-Handels GmbH. Apparatus for drawing a side-folded tube over piled objects. 4,064,678, Cl. 53-183.000.

Grollman, Jack D.: *See*—
Mazie, Lowell I.; Friedman, Henry C.; Getzler, Nathaniel; and Grollman, Jack D., 4,064,988, Cl. 206-44.00R.

Groner, Norman Arlo, to Victor United, Inc. Compound bow. 4,064,862, Cl. 124-23.00R.

Groody, James. Artist's board. 4,065,596, Cl. 428-215.000.

Groves, James N., to General Electric Company. Detection of catalase-containing bacteria. 4,065,357, Cl. 195-103.50R.

Gruller, David L.: *See*—
Echols, Marvin C.; and Gruller, David L., 4,064,619, Cl. 29-458.000.

Grundei, Hans; and Thomas, Wolfram, to Sanitatshaus Schuutt & Grundei. Knee-joint endoprostheses. 4,064,568, Cl. 3-1.911.

Grunewald, Ernst: *See*—
Geiger, Paul B.; Grunewald, Ernst; and Vallor, Ben J., 4,064,887, Cl. 134-144.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Zellmer, Neale A., 4,065,807, Cl. 363-16.000.

GTE Laboratories Incorporated: *See*—
Haugsjaa, Paul O.; and Feuersanger, Alfred E., 4,065,701, Cl. 315-248.000.

GTE Sylvania Incorporated: *See*—
MacInnis, Martin B.; and Quatrini, L. Rita, 4,065,413, Cl. 260-9.000.

Gulf Oil Corporation: *See*—
Collins, Kenneth L., 4,064,953, Cl. 175-321.000.

Gulf Research & Development Company: *See*—
Bacha, John D.; Matthews, Joseph S.; and Selwitz, Charles M., 4,065,470, Cl. 260-346.750.
Bailey, Wayne E., 4,065,395, Cl. 252-25.000.
Swift, Harold E.; and Vogel, Roger F., 4,065,380, Cl. 208-89.000.

Gulick, Joseph F.; and Marlow, Donald R., to United States of America, Navy. Random scanning receiver. 4,065,771, Cl. 343-100.0SA.

Gun, Dmitry Rudolfovich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Lurie, Mikhail Vladimirovich; Topolyansky, Jury Arnoldovich; Kantor, Ilya Solomonovich; Chizhikov, Anatoly Petrovich; and Gun, Dmitry Rudolfovich, 4,065,076, Cl. 243-38.000.

Gunlock, Donald E.; and Manetta, John A., to General Motors Corporation. Cushion retention for a vehicle seat. 4,065,181, Cl. 297-452.000.

Guscinov, Idris Aslan ogly: *See*—
Rizaev, Ramiz Gasan Kuli ogly; Mekhtiev, Soltan Dzhafarovich; Magerramova, Zemfira Jusif kyzy; Sheinin, Viktor Efimovich; Mirataev, Mirabdulla Mirakhmed ogly; and Guscinov, Idris Aslan ogly, 4,065,487, Cl. 260-465.00C.

Gustafson, Kenneth C.; and Chastain, Edward L., to Fibron, Inc. Process for reducing dust in fibrillated yarn. 4,065,538, Cl. 264-154.000.

Gutknecht, Peter, to Westinghouse Electric Corporation. Insulated-gate thin film transistor with low leakage current. 4,065,781, Cl. 357-23.000.

Guyton, James H.: *See*—
Penningroth, Herbert M.; and Guyton, James H., 4,065,719, Cl. 325-312.000.

H. G. Olson & Co., Inc.: *See*—
Olson, Harold G., 4,064,654, Cl. 49-489.000.

Haak, Willard Q.; and Carlson, Guy C., Jr., to Caterpillar Tractor Co. Dual radial piston pump or motor. 4,064,790, Cl. 91-492.000.

Habib, Robert. Machine for machining spiral cutting edges on cutting tools. 4,064,657, Cl. 51-33.00W.

Hacker, Wolf-Dieter; Friese, Karl-Hermann; Steinke, Leo; and Weyl, Helmut, to Robert Bosch GmbH. Electrochemical oxygen sensing element, particularly for determination of oxygen content in the exhaust gases of automotive internal combustion engines. 4,065,372, Cl. 204-195.00S.

Hakamata, Yoshio: *See*—
Takahashi, Yutaka; Hakamata, Yoshio; and Konno, Masamitu, 4,064,677, Cl. 53-123.000.

Hale Fire Pump Company: *See*—
Eberhardt, H. Alfred, 4,064,891, Cl. 137-98.000.

Haley, Paul H.: *See*—
Whyte, Ian A.; and Haley, Paul H., 4,065,763, Cl. 340-310.00R.

Hall, Charles B.; and Young, Robert F., to Outboard Marine Corporation. Hydraulically powered marine propulsion tilting and trimming system with memory. 4,064,824, Cl. 115-41.0HT.

Haller, Thomas L., to Procter & Gamble Company, The. Non-spurting twist-open dispensing closure. 4,065,037, Cl. 222-153.000.

Hallerback, Stig Lennart, to SKF Industrial Trading and Development Company, B.V. Self adjusting elevating temperature bearing and housing. 4,065,190, Cl. 308-15.000.

Halliburton Company: *See*—
Barrington, Burchus Q., 4,064,937, Cl. 166-162.000.

Halstead Industries, Inc.: *See*—
Nussbaum, Otto J., 4,064,868, Cl. 126-271.000.

Hamblin, Richard David, to Archibald Kenrick and Sons Limited. Door handle mechanisms. 4,065,165, Cl. 292-348.000.

Hamer, Anthony David; and Karol, Frederick John, to Union Carbide Corporation. Phenol modified polymerization catalyst and polymerization process. 4,065,612, Cl. 526-130.000.

Hamilton, Willard C.: *See*—
Jelfo, Raymond L.; Strella, Stephen; and Hamilton, Willard C., 4,065,585, Cl. 427-11.000.

Hamling, Bernard H.; and Naumann, Alfred W., to Union Carbide Corporation. Finely divided metal oxides and sintered objects therefrom. 4,065,544, Cl. 423-252.000.

Hamster, Helmut: *See*—
Koppl, Franz; Griesshammer, Rudolf; and Hamster, Helmut, 4,065,533, Cl. 264-81.000.

Handing, Theodore E. Smoke detector. 4,065,759, Cl. 340-237.500.

Haney, Robert M., to J. I. Case Company. Electronic depth control system. 4,064,945, Cl. 172-4.000.

Hannon, James V.: *See*—
King, George; and Hannon, James V., 4,064,676, Cl. 53-77.000.

Hanson, Lester. Apparatus and system for processing oil shale. 4,065,361, Cl. 196-98.000.

Harada, Tetsuo: *See*—
Kataoka, Yushin; Harada, Tetsuo; and Takagi, Kenji, 4,065,362, Cl. 203-58.000.

Harada, Yoshimi: *See*—
Kawaguchi, Yoshihiko; Harada, Yoshimi; Miki, Makoto; Gouda, Kanenari; Akiyama, Masaharu; Tokura, Masayuki; and Kuroha, Jun, 4,065,419, Cl. 260-28.50D.

Hardin, John R., Jr.: *See*—
Frazier, Donald; and Hardin, John R., Jr., 4,065,089, Cl. 248-245.000.

Hardman, Harley F.; Callahan, James L.; and Grasselli, Robert K., to Standard Oil Company. Preparation of methacrylic derivatives from tertiary butyl-containing compounds. 4,065,507, Cl. 260-604.00R.

Hardouin, Michel Jean Charles: *See*—
Tilly, Guy; Hardouin, Michel Jean Charles; and Lautrou, Jean, 4,065,553, Cl. 424-5.000.
Tilly, Guy; Hardouin, Michel Jean Charles; and Lautrou, Jean, 4,065,554, Cl. 424-5.000.

Hardware Designers, Inc.: *See*—
Stein, Robert R., 4,065,196, Cl. 312-333.000.

Harms, Wolfgang: *See*—
Bien, Hans-Samuel; and Harms, Wolfgang, 4,065,446, Cl. 260-146.00D.

Harnessed Energies, Inc.: *See*—
Robinson, Kermit Hamlin, 4,065,745, Cl. 340-3.00D.

Harpster, Joseph William. Ultraviolet sensor and exposure instrument. 4,065,672, Cl. 250-372.000.

Harrison, Arthur Michael, to Micron Instruments. Pressure transducer structure. 4,064,758, Cl. 73-398.0AR.

Harrison & Sons (High Wycombe) Limited: *See*—
Wood, William, 4,064,645, Cl. 40-159.000.

Harrison, Stuart A., to General Mills Chemicals, Inc. High molecular weight radiation curable resins. 4,065,627, Cl. 560-26.000.

Hart Associates, Inc.: *See*—
Gezari, Walter A., 4,065,230, Cl. 417-317.000.

Hartman, George F. Swivels. 4,064,604, Cl. 24-236.000.

Harty, Gene R.: *See*—
Andersen, John A.; and Harty, Gene R., 4,065,217, Cl. 403-24.000.

Harvey, Donald Malcolm, to Eastman Kodak Company. Automatic rangefinder and focusing apparatus. 4,065,778, Cl. 354-25.000.

Hasegawa, Ryusuke, to Allied Chemical Corporation. Glassy metal alloy temperature sensing elements for resistance thermometers. 4,064,757, Cl. 73-362.0AR.

Hasegawa, Shoichi: *See—*
Nishiumi, Shiro; Hasegawa, Shoichi; Mizoguchi, Toshiyuki; and Furuta, Sachiko, 4,065,599, Cl. 428-402.000.

Hashimoto, Akihiko: *See—*
Maitani, Yoshihisa; Shimoyama, Kunio; Yoshida, Muneaki; Hashimoto, Akihiko; and Kitagawa, Masahiro, 4,065,777, Cl. 354-23.00R.

Hastik, Walter: *See—*
Cappel, Fred; Hastik, Walter; Fleming, Georges; and Hofmann, Pierre, 4,065,295, Cl. 75-5.000.

Hatz, Ernst, to Motorenfabrik Hatz GmbH & Co. KG. Internal combustion engine with a pressure-compensating arrangement in the crankcase of the engine. 4,064,853, Cl. 123-119.00B.

Hauck, Frederic P.; and Reid, Joyce, to E. R. Squibb & Sons, Inc. Cyclitolamines. 4,065,485, Cl. 260-464.000.

Haug, Theobald: *See—*
Muller, Albrecht; Haug, Theobald; and Renner, Alfred, 4,065,433, Cl. 260-47.0UA.

Haugsjaa, Paul O.; and Feuersanger, Alfred E., to GTE Laboratories Incorporated. Electrodeless light source with reduced heat losses. 4,065,701, Cl. 315-248.000.

Haugwitz, Rudiger D.: *See—*
Narayanan, Venkatachala L.; Gadebusch, Hans H.; and Haugwitz, Rudiger D., 4,065,563, Cl. 424-272.000.

Hauser, Raimund: *See—*
Freudenschuss, Otto, 4,065,209, Cl. 352-72.000.

Haws, Spencer Kim. Machine for harvesting asparagus stalks and the like. 4,064,682, Cl. 56-327.00A.

Hayashi, Masaki; Kori, Seiji; Miyake, Hajimu; and Okada, Takanori, to Ono Pharmaceutical Company. 16-Phenoxy and phenylthio prostaglandin derivatives. 4,065,632, Cl. 560-55.000.

Hayashi, Teishichi, to Nichimen Co., Ltd. Wrap feeding device for circular knitting machine. 4,064,709, Cl. 66-135.000.

Heckele, Helmut, to Riwoplan Medizin-Technische Einrichtungs-Gesellschaft mbH. Apparatus for cleansing endoscopes. 4,064,886, Cl. 134-95.000.

Heeren, Richard H., to Teletype Corporation. Dynamic logic system. 4,065,679, Cl. 307-251.000.

Heian, Glenn A.; and Kohl, Robert F., to Allis-Chalmers Corporation. System for handling high sulfur materials. 4,065,320, Cl. 106-100.000.

Heiderpriem, Theodore B. Buns which have centrally-located recesses. 4,065,581, Cl. 426-138.000.

Heimberger, Helmut, to Optilon W. Erich Heilmann GmbH. Warp-knit slide fastener stringer half and method of making same. 4,064,602, Cl. 24-205.10C.

Heinrich, Richard P.: *See—*
Morris, Gilbert; and Heinrich, Richard P., 4,064,622, Cl. 29-625.000.

Heinsohn, Howard H., Jr.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and Schmitt, Frederick Louis, 4,065,408, Cl. 252-522.000.

Helgorsky, Jacques: *See—*
Leroy, Maurice; and Helgorsky, Jacques, 4,065,547, Cl. 423-321.00S.

Helmick, B. J. Sliding door roller assembly. 4,064,593, Cl. 16-105.000.

Helmick, James C., to Victor United, Inc. Arrow rest. 4,064,863, Cl. 124-41.00A.

Hemsath, Klaus H.; and Vereecke, Frank J., to Midland-Ross Corporation. Spray mist cooling arrangement. 4,065,252, Cl. 432-77.000.

Hen, John, to Uniroyal, Inc. Paper coating latex compositions containing copolymers of monovinylidene aromatic monomer, aliphatic conjugated diene and an aryloyloxycarboxylic acid monomer. 4,065,423, Cl. 260-29.70H.

Henry, Paul Mike: *See—*
Lillis, William Joseph; and Henry, Paul Mike, 4,065,725, Cl. 330-254.000.

Hentges, James John: *See—*
Contractor, Rashmikant Maganlal; Dodson, William Carter, Jr.; Hentges, James John; and Seppala, Earl Edwin, 4,064,597, Cl. 19-156.300.

Hercules Incorporated: *See—*
Desmarais, Armand Joseph, 4,065,319, Cl. 106-93.000.
Legrand, Richard Webster, 4,065,535, Cl. 264-94.000.
McAllister, Patrick Von, 4,065,592, Cl. 428-92.000.
Peterson, Albert Henry, 4,065,593, Cl. 428-92.000.

Herczog, Andrew, to Corning Glass Works. Hermetic enclosure for electronic component. 4,065,636, Cl. 174-52.00S.

Herman Hemscheidt Maschinenfabrik: *See—*
Friedrichs, Hans-Otto, 4,064,701, Cl. 61-45.00D.

Hermann Heye: *See—*
Becker, Kurt, 4,065,286, Cl. 65-229.000.

Hermann, Jean; and Choffat, Hubert, to Centre Electronique Horloger S.A. Piezoelectric resonator for timepieces and method for making same. 4,065,684, Cl. 310-351.000.

Hermes, Chester E.: *See—*
Pittman, Robert W.; and Hermes, Chester E., 4,064,749, Cl. 73-152.000.

Herriford, James Lester: *See—*
Castle, William Harold; Crowe, William Ray; and Herriford, James Lester, 4,064,985, Cl. 197-114.00R.

Herrmann, Gunther, to Photocircuits Division of Kollmorgen Corporation. Process for the electrometric measurement of cyanide ions in solutions containing metal ions. 4,065,363, Cl. 204-1.00T.

Hervert, George L., to UOP Inc. Apparatus for the preparation of semiconducting pyropolymeric inorganic refractory oxide materials. 4,064,829, Cl. 118-49.100.

Heslop, Lorne C., to McKee Bros. Limited. Stack feeder. 4,065,062, Cl. 241-101.700.

Heubach, Frank: *See—*
Schomberg, Hermann; and Heubach, Frank, 4,065,808, Cl. 364-200.000.

Hewett, Alan R.; and Robilliard, Leonard T., to Dexion-Comino International Limited. Shelves. 4,064,813, Cl. 108-60.000.

Hewlett-Packard Company: *See—*
Dehart, Scott Alan, 4,065,796, Cl. 360-51.000.

Heymes, Alain; and Maffrand, Jean-Pierre, to Parcor. 4,5,6,7-Tetrahydro-thieno[3,2-c]-pyridine derivatives and process for their preparation. 4,065,460, Cl. 260-294.80C.

Heymes, Alan; and Maffrand, Jean-Pierre, to Parcor. Process for the preparation of thieno(3,2-c) pyridine and derivatives thereof. 4,065,459, Cl. 260-294.80C.

Hiatt, Sarah: *See—*
Moscowitz, George S.; Rosen, John F.; and Hiatt, Sarah, 4,064,877, Cl. 128-188.000.

Hicks, William R.; and Miller, Homer R., to General Electric Company. SCR controlled universal motor. 4,065,705, Cl. 318-245.000.

Hile, John W.: *See—*
Jaffe, James M.; and Hile, John W., 4,065,715, Cl. 324-60.0CD.

Hill, David A.; Pearson, Durk J.; Motley, Ethelyn P.; Beard, Thomas N.; and Farrell, James L., to TRW Inc. Recovery system for oil shale deposits. 4,065,183, Cl. 299-4.000.

Hill, Homer G.: *See—*
Wong, Robert; and Hill, Homer G., 4,065,417, Cl. 260-17.4CL.

Hill, Howard D. W., to Varian Associates, Inc. Pulsed RF excited spectrometer having improved pulse width control. 4,065,714, Cl. 324-.50A.

Hilti Aktiengesellschaft: *See—*
Chromy, Franz, 4,064,949, Cl. 173-14.000.

Hinze, Dietrich. Method of manufacturing pressure pots having a bayonet catch, and apparatus for carrying out such method. 4,064,726, Cl. 72-70.000.

Hirata, Suekazu: *See—*
Nakaya, Keiichi; Hirata, Suekazu; and Sato, Kunio, 4,065,270, Cl. 23-299.000.

Hirose, Masahiko: *See—*
Ogawa, Kazuyuki; Hirose, Masahiko; Shibagaki, Masahiro; Murakami, Yoshio; and Horiike, Yasuhiro, 4,065,369, Cl. 204-164.000.

Hirschberg, Henry: *See—*
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Hirvisaari, Eero: *See—*
Salmi, Pekka; Strom, Rolf; and Hirvisaari, Eero, 4,064,950, Cl. 173-151.000.

Hiscutt, Robert: *See—*
King, Robert David; Hiscutt, Robert; and Molineux, Peter, 4,065,600, Cl. 428-432.000.

Hitachi, Ltd.: *See—*
Inose, Fumiyuki; and Geri, Don Winston, 4,064,983, Cl. 197-1.00A.
Iwasaka, Tatsuo; Kaneko, Takashi; and Shimazaki, Seiichi, 4,064,971, Cl. 187-29.00R.
Kashiwazaki, Seiichi, 4,064,859, Cl. 123-148.00E.

Hitachi Shipbuilding and Engineering Co., Ltd.: *See—*
Okigami, Noboru; Sekiguchi, Yoshitoshi; Ito, Takusen; and Onose, Kenji, 4,065,247, Cl. 431-202.000.

Hobart Corporation: *See—*
Geiger, Paul B.; Grunewald, Ernst; and Vallor, Ben J., 4,064,887, Cl. 134-144.000.

Hodgson, David A.; and Grey, James S., to International Power Pole, Ltd. Anti-theft device. 4,064,715, Cl. 70-18.000.

Hoechst Aktiengesellschaft: *See—*
Gerigk, Gunter; Bittner, Klaus-Jurgen; and Kostner, Armin, 4,064,673, Cl. 53-3.000.
Schroter, Herbert, 4,065,119, Cl. 271-172.000.
von der Eltz, Hans-Ulrich, 4,064,583, Cl. 8-149.100.

Hofer, Gerald; Bofinger, Gunter; Nothdurft, Heinz; Khosrawi, Mohammad-Ali; Simon, Helmut; and Konrath, Karl, to Robert Bosch GmbH. Fuel injection pump for an internal combustion engine. 4,065,236, Cl. 417-493.000.

Hofer, Wolfgang; Schliebs, Reinhard; Schmidt, Robert; and Eue, Ludwig, to Bayer Aktiengesellschaft. Novel 2-chloroethane-(thiono)-phosphonic acid amido compounds and plant growth inhibiting compositions. 4,065,288, Cl. 71-76.000.

Hoffend, Thomas R.: *See—*
Eddy, Clifford O.; and Hoffend, Thomas R., 4,065,586, Cl. 427-22.000.

Hoffmann-La Roche Inc.: *See—*
Brossi, Arnold; Pecherer, Benjamin; and Sunbury, Robert, 4,065,473, Cl. 260-340.50R.

Hoffmeister, Friedrich: *See—*
Mayer, Karl Heinrich; Hoffmeister, Friedrich; and Wuttke, Wolfgang, 4,065,568, Cl. 424-273.00P.

Hofmann, Pierre: *See—*
Cappel, Fred; Hastik, Walter; Fleming, Georges; and Hofmann, Pierre, 4,065,295, Cl. 75-5.000.

Holcomb, Larry Wayne. Tape transport for a cassette. 4,065,075, Cl. 242-199.000.

Holder, Charles B.: *See—*
Lachowicz, Donald R.; and Holder, Charles B., 4,065,521, Cl. 260-879.000.

Holdinghausen, Paul: *See*—
Giers, Alfred; Holdinghausen, Paul; Schneider, Hatto; and Widmann, Friedman, 4,064,761, Cl. 73-462.000.
Holland, Eugene Richard; and Schlieman, Melvin Glynn. Crane swing safety control. 4,064,997, Cl. 212-39.00B.
Hollandsche Beton Groep N. V.: *See*—
Jansz, Joost W., 4,064,702, Cl. 61-53.500.
Hollandse Signaalapparaten B.V.: *See*—
Nijhuis, Jan, 4,064,684, Cl. 57-35.000.
Holmberg, Gote Eskil Yngve. Safety belt retractor. 4,065,071, Cl. 242-107.40A.
Holowaty, Michael O.: *See*—
Aktay, Ali I.; Bodnaruk, Bohdan J.; and Holowaty, Michael O., 4,065,385, Cl. 210-44.000.
Holste, Hilary E.: *See*—
Ladage, Lawrence; and Holste, Hilary E., 4,065,267, Cl. 23-263.000.
Holtz, Hans D., to Phillips Petroleum. Alcohol production. 4,065,511, Cl. 260-635.00R.
Holtzman, Kenneth Allan, to Bell Telephone Laboratories, Incorporated. Printed circuit cover coating comprising an ultraviolet radiation sensitive acrylic resin. 4,065,368, Cl. 204-159.230.
Holzbaur, Siegfried, to Robert Bosch GmbH. Fuel metering and injection system for internal combustion engines. 4,064,843, Cl. 123-32.0EJ.
Holzbaur, Siegfried; and Barth, Horst, to Robert Bosch GmbH. Fuel injection system for internal combustion engines. 4,064,847, Cl. 123-32.0EJ.
Homery, Alex. Metal forming device. 4,064,729, Cl. 72-256.000.
Homs, Juan Puigdomenech. Pivoted window. 4,064,651, Cl. 49-319.000.
Honeywell Inc.: *See*—
Elias, Jack, 4,065,676, Cl. 307-66.000.
Kardashian, Vahram S., 4,065,757, Cl. 365-244.000.
Sikorra, Daniel J., 4,065,189, Cl. 308-10.000.
Honeywell Information Systems Inc.: *See*—
Diaz, Nelson Ramon, 4,064,917, Cl. 140-105.000.
Honnert, Quentin E.: *See*—
Stapp, Willis J.; and Honnert, Quentin E., 4,064,675, Cl. 53-54.000.
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Webb, John; and Houghton, Alan, 4,065,582, Cl. 426-231.000.
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Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, to Gates Rubber Company, The. Apparatus for making spirally wound electrochemical cells. 4,064,725, Cl. 72-147.000.
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Hunt, Harrell E. Signal device for rural type mailboxes. 4,065,050, Cl. 232-34.000.
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Hurni, William M., to Merck & Co., Inc. Cell removing device. 4,065,359, Cl. 195-127.000.
Husa, Marlin V. Heating apparatus. 4,064,864, Cl. 126-121.000.
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Hutton, Thomas W.; and Rogers, Pamela J., to Rohm and Haas Company. Process for increasing molecular weight of a polymer. 4,065,523, Cl. 260-885.000.
Hyde, Richard E.; and Carmichael, Lee T., to California Strolee, Inc. Infant carrier assembly. 4,065,177, Cl. 297-327.000.
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Miyagishima, Toshi, 4,064,601, Cl. 24-16.0PB.
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Walters, Ronald D., 4,064,577, Cl. 5-334.00R.
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ICI Americas Inc.: *See*—
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Ideal Toy Corporation: *See*—
Bartok, Stephen, 4,065,129, Cl. 273-121.00A.
Idel, Vladimir Viktorovich. Machine for sharpening band saw teeth. 4,064,770, Cl. 76-37.000.
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Iida, Akio, to Kabushiki Kaisha Komatsu Seisakusho. Fluid suspension system. 4,065,143, Cl. 280-43.230.
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Ikeda, Hideo: *See*—
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Willmore, Bruce Albert Edward, 4,065,609, Cl. 526-61.000.
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Bussell, George W.; and Kisel, Martin W., 4,065,425, Cl. 260-33.6EP.
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Arrasmith, Fred Victor; Bruns, Donald George; Moffitt, John Stuart; and Moss, Stanton Kline, 4,065,123, Cl. 271-215.000.
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International Computers Limited: *See—*
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International Flavors & Fragrances Inc.: *See—*
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International Harvester Company: *See—*
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Smith, Spencer E.; and Marek, Donald C., 4,064,768, Cl. 74-528.000.
International Nickel Company, Inc., The: *See—*
Subramanian, Kohur Nagaraja; and Glaum, Gerald Vernon, 4,065,542, Cl. 423-35.000.
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International Standard Electric Corporation: *See—*
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International Telephone and Telegraph Corporation: *See—*
Goell, James E.; and Brandt, H. David, 4,065,203, Cl. 350-96.00C.
Kao, Charles K.; Goell, James E.; and Maklad, Mokhtar S., 4,065,280, Cl. 65-3.00A.
Moore, John R., 4,064,623, Cl. 29-629.000.
November, Milton H., 4,064,738, Cl. 73-32.00A.
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INTERx Research Corporation: *See—*
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Benjamin, Thomas A., 4,064,760, Cl. 73-421.00R.
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Blackburn, Bobby J., 4,064,704, Cl. 73-660.000.
Ireland, Tracy. Method and apparatus for measuring performance times of a shutter apparatus. 4,064,736, Cl. 73-5.000.
Iriarte, Wilfrido R., to Hughes Aircraft Company. All climate heat exchanger unit with adjustable temperature and defrost control. 4,064,932, Cl. 165-1.000.
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Iwano, Yoshihiko; and Une, Katsumi, to Tokyo Shibaura Electric Co., Ltd. Nuclear fuel element. 4,065,352, Cl. 176-68.000.
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Iwata, Hiroshi; and Ishikawa, Katsuji, to West Electric Co., Ltd. Camera with automatic flash exposure system. 4,065,776, Cl. 354-23.00D.
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J.R. Schneider Co., Inc.: *See—*
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Jablanofsky, Charles C.: *See—*
Garczynski, John S.; Jablanofsky, Charles C.; and Murray, Joseph P., 4,065,662, Cl. 235-419.000.
Jablin, Richard. Repair gun for coke ovens. 4,065,059, Cl. 239-184.000.
Jackson, Harold Leonard, to Du Pont de Nemours, E. I., and Company. Fluorocarbon dye dispersion for exhaust disperse dyeing. 4,065,259, Cl. 8-166.000.
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Spanel, Abram N.; Eiland, P. Frank; and Jacobs, David R., 4,064,816, Cl. 112-79.00A.
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Jaffe, Wolfgang; and Peterson, Wesley Robinson, to Singer Company, The. Reversible direction solenoid assembly. 4,065,739, Cl. 335-234.000.
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Japan Port Consultants, Ltd.: *See—*
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Jaskowsky, Jorg, to Eastman Kodak Company. Photofinishing apparatus. 4,065,661, Cl. 364-464.000.
Jassby, Daniel L.; and Kulsrud, Russell M., to United States of America, Energy Research and Development Administration. Particle beam injection system. 4,065,351, Cl. 176-5.000.
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Jelfo, Raymond L.; Strella, Stephen; and Hamilton, Willard C., to Xerox Corporation. Renewable chow fuser coating. 4,065,585, Cl. 427-11.000.
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Jenkins, Renaldo V.; and Sabol, Alexander P. Rotary engine. 4,064,841, Cl. 123-8.470.

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Johnson, Dwight N. Fluid level control valve. 4,065,095, Cl. 251-118.000.

Johnson, George Michael; Krueger, Kenneth Keith; and Pavlov, Todor, to Shiley Laboratories, Inc. Tracheostomy tube with pressure relief valve. 4,064,882, Cl. 128-351.000.

Johnson, James Edward; Foster, Tom; and Allan, Roy Duncan, to United States of America, National Aeronautics and Space Administration. Variable cycle gas turbine engines. 4,064,692, Cl. 60-261.000.

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Johnson, William Glen, Sr. Variable frequency oscillator having programmable digital frequency display. 4,065,727, Cl. 331-51.000.

Johnston, Herbert N.; Wray, Joseph A.; Robbins, Joe David; and Schrager, Morton, to Xerox Corporation. Method for fixing ink images. 4,065,304, Cl. 96-1.0LY.

Johnston, Laird E., to General Motors Corporation. Door hold-open mechanism. 4,064,652, Cl. 49-394.000.

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Jones, Frederick J. Refuse container. 4,065,051, Cl. 232-43.200.

Jones, John R. Cooking apparatus. 4,064,796, Cl. 99-330.000.

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Jones, William B., to General Electric Company. Circuit breaker mounted within an explosion-proof enclosure. 4,065,653, Cl. 200-302.000.

Jordan, Thomas W., to Wescom, Inc. LED Mounting retainer and display. 4,065,198, Cl. 339-17.00D.

Jotterand, Armand, to Sandoz Ltd. Azo compounds having a 3-arylthio- or aliphaticthio-4-cyano- or alkoxycarbonyl-pyrazolyl-5 diazo component radical. 4,065,447, Cl. 260-163.000.

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Judd, David John, to Murphy Chemical Limited. Method of making solid fertilizer herbicide granules. 4,065,289, Cl. 71-82.000.

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Kaji, Masao: *See*—
Asami, Hiroshi; and Kaji, Masao, 4,065,374, Cl. 204-228.000.

Kallenborn, John, to PPG Industries, Inc. Method and apparatus for collecting strand material. 4,065,065, Cl. 242-18.00G.

Kalmus, Henry P.: *See*—
Apstein, Maurice; and Kalmus, Henry P., 4,064,806, Cl. 102-70.20R.

Kameda, Yukihiko: *See*—
Horii, Satoshi; Kameda, Yukihiko; and Mizokami, Nariakira, 4,065,615, Cl. 536-10.000.

Kamienski, Paul W.: *See*—
Say, Geoffrey R.; Baird, William C., Jr.; and Kamienski, Paul W., 4,065,381, Cl. 208-134.000.

Kaminaka, Nobuyuki: *See*—
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, 4,065,797, Cl. 360-113.000.

Kanai, Kenji: *See*—
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, 4,065,797, Cl. 360-113.000.

Kandachi, Takayoshi: *See*—
Chujo, Yoshimasa; and Kandachi, Takayoshi, 4,064,832, Cl. 118-323.000.

Kane Manufacturing Corporation: *See*—
Boeckman, Maynard A.; and Singer, Richard M., 4,064,719, Cl. 70-355.000.

Kaneko, Takashi: *See*—
Iwasaka, Tatsuo; Kaneko, Takashi; and Shimazaki, Seiichi, 4,064,971, Cl. 187-29.00R.

Kann-Rasmussen, Lars Erik: *See*—
Rasmussen, Villum Benedikt Kann; and Kann-Rasmussen, Lars Erik, 4,064,649, Cl. 49-250.000.

Kantor, Ilya Solomonovich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Lurie, Mikhail Vladimirovich; Topolyansky, Jury Arnoldovich; Kantor, Ilya Solomonovich; Chizhikov, Anatoly Petrovich; and Gun, Dmitry Rudolfovich, 4,065,076, Cl. 243-38.000.

Kao, Charles K.; Goell, James E.; and Maklad, Mokhtar S., to International Telephone and Telegraph Corporation. Continuous process for manufacturing optical fibers. 4,065,280, Cl. 65-3.00A.

Kao, James T. F., to Ethyl Corporation. Process for preparing halophosphazene mixtures. 4,065,546, Cl. 423-300.000.

Karay, John. Leg-restraining device for geriatric chair. 4,065,180, Cl. 297-384.000.

Kardashian, Vahram S., to Honeywell Inc. Thin film plated wire magnetic switch of adjustable threshold. 4,065,757, Cl. 365-244.000.

Karol, Frederick John: *See*—
Hamer, Anthony David; and Karol, Frederick John, 4,065,612, Cl. 526-130.000.

Karpati, Egon: *See*—
Lorincz, Csaba; Szasz, Kalman; Bolyos, Maria; Jovanovics, Karola; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,065,458, Cl. 260-293.550.

Karreman, Jacob: *See*—
Acda, Petrus Marinus; and Karreman, Jacob, 4,065,243, Cl. 425-393.000.

Karrer, Friedrich, to Ciba-Geigy Corporation. Polyphenoxy alkanes. 4,065,508, Cl. 260-613.00R.

Kaser, Rene: *See*—
Siegwart, Hans-Rudolf; and Kaser, Rene, 4,065,098, Cl. 254-29.00A.

Kashio, Toshio, to Casio Computer Co., Ltd. Digital display type timepiece. 4,064,687, Cl. 58-4.00A.

Kashiwazaki, Seiichi, to Hitachi, Ltd. Semiconductor ignition system. 4,064,859, Cl. 123-148.00E.

Kashyap, Satish C.: *See*—
Wong, James Y.; Kashyap, Satish C.; and Dunn, John G., 4,065,655, Cl. 219-10.55D.

Kataoka, Yushin; Harada, Tetsuo; and Takagi, Kenji, to Sumitomo Bayer Urethane Co., Ltd. Purification of organic isocyanates. 4,065,362, Cl. 203-58.000.

Katayama, Shigenari: *See*—
Sasajima, Kikuo; Ono, Keiichi; Nakao, Masaru; Maruyama, Isamu; Katayama, Shigenari; Inaba, Shigeho; and Yamamoto, Hisao, 4,065,565, Cl. 424-250.000.

Kathawala, Faizulla G., to Sandoz, Inc. p-Phenoxy-alkylphenones and corresponding alcohols. 4,065,503, Cl. 260-592.000.

Kato, Fumiaki: *See*—
Matsumoto, Junichiro; Iizuka, Haruhiko; and Kato, Fumiaki, 4,064,844, Cl. 123-32.0EA.

Kato, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Spark-ignition engine for lean air-fuel mixture. 4,064,860, Cl. 123-191.00S.

Kato, Toshikiyo: *See*—
Yasuda, Tetsuya; Iinuma, Yoshio; Maekawa, Yuzo; Kato, Toshikiyo; and Yoshida, Masaru, 4,064,689, Cl. 58-50.00R.

Kato, Yoshihiro: *See*—
Masui, Akira; Yamada, Kenzo; Ninomiya, Akinori; Tachibana, Katsuhiko; and Kato, Yoshihiro, 4,065,298, Cl. 75-60.000.

Katoh, Takashi; and Otani, Susumu, to Kabushiki Kaisha Toyoda

Jidoshokki Seisakusho. Taker-in-part of the conventional flat card. 4,064,598, Cl. 19-105.000.

Kattner, Lionel E.; Youmans, Albert P.; and Shasby, Patrick J., to Signetics Corporation. Multi-point microprobe for testing integrated circuits. 4,065,717, Cl. 324-158.00P.

Katz, Klaus: *See*—
Bordovsky, Jaromir; and Katz, Klaus, 4,064,789, Cl. 91-417.00R.

Kawabata, Takao, to Mitsubishi Denki Kabushiki Kaisha. Chopper assisted uninterruptible power supply. 4,065,711, Cl. 320-14.000.

Kawabe, Norio: *See*—
Hosoi, Kazuo; Kawabe, Norio; and Ohno, Masaji, 4,065,475, Cl. 260-348.310.

Kawaguchi, Yoshihiko; Harada, Yoshimi; Miki, Makoto; Gouda, Kanenari; Akiyama, Masaharu; Tokura, Masayuki; and Kuroha, Jun. Fluoro-elastomer composition having improved processability. 4,065,419, Cl. 260-28.50D.

Kawai, Shoji; Nishimura, Kenichi; and Fukuda, Mitsuo, to Kabushiki Kaisha Kyoto Daiichi Kagaku. Apparatus for producing reactions in colorimetric cells. 4,065,358, Cl. 195-127.000.

Kawamoto, Akio: *See*—
Kondoh, Teruo; Ban, Kazuhiro; Kawamoto, Akio; Masuno, Yoshiki; and Yoshida, Mitsuhiro, 4,065,768, Cl. 343-9.000.

Kawano, Susumu: *See*—
Amano, Tadashi; Kawano, Susumu; Mano, Kenji; and Irisawa, Takaji, 4,064,727, Cl. 72-179.000.

Kedzierski, Elizabeth. Pad and divider combination. 4,065,021, Cl. 220-22.000.

Keeler, William T.: *See*—
Bergman, John E.; Keeler, William T.; and McKenna, Patrick J., 4,064,658, Cl. 51-110.000.

Keim, Robert E., to General Electric Company. Electric toaster control. 4,065,658, Cl. 219-386.000.

Keller, Richard N.: *See*—
Pokorny, Joseph E.; and Keller, Richard N., 4,064,814, Cl. 108-64.000.

Kelley Company, Inc.: *See*—
Catlett, John C., 4,064,924, Cl. 160-354.000.

Kellstrom, Erik Magnus, to SKF Industries, Inc. Roller skew control for tapered roller bearings. 4,065,191, Cl. 308-202.000.

Kendall, Don Leslie; and Judy, Millard Monroe, to Texas Instruments Incorporated. Composite semiconductor structures. 4,065,742, Cl. 338-9.000.

Kenny, Bernice S. Integral rain cape and hat. 4,064,562, Cl. 2-84.000.

KeNova AB: *See*—
Nilson, Billy N., 4,065,033, Cl. 222-107.000.

Kesler, Johan Peter: *See*—
Khouw, Boen Tie; and Kesler, Johan Peter, 4,065,355, Cl. 195-66.00R.

Keup, Uwe: *See*—
Frommer, Werner; Gericke, Horst; Keup, Uwe; Puls, Walter; Schmidt, Delt; and Wagner, Otto, 4,065,557, Cl. 424-181.000.

Khosrawi, Mohammad-Ali: *See*—
Hofer, Gerald; Bofinger, Gunter; Nothdurft, Heinz; Khosrawi, Mohammad-Ali; Simon, Helmut; and Konrath, Karl, 4,065,236, Cl. 417-493.000.

Khouw, Boen Tie; and Kesler, Johan Peter, to Canada Packers Limited. Purification of deoxyribonuclease. 4,065,355, Cl. 195-66.00R.

Kiener, Heinz: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; Burkl, Erich; and Kiener, Heinz, 4,065,193, Cl. 308-233.000.

Kikuchi, Yosio; Miyabayashi, Noriyuki; and Wada, Masao, to Nippon-kai Heavy Industries Co., Ltd. Electric dust precipitator. 4,065,275, Cl. 55-121.000.

Killick, Herbert Percy, to C.M.W. Laboratories Limited. Dental units and the like. 4,064,630, Cl. 32-22.000.

Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., to Shell Oil Company. Oxidation process. 4,065,505, Cl. 260-600.00R.

Kim, Sunyong P. Compact shower structure. 4,064,570, Cl. 4-147.000.

Kimura, Kunio: *See*—
Nishino, Atsushi; Sonetaka, Kazunori; and Kimura, Kunio, 4,065,406, Cl. 252-443.000.

Kine-Tech Corporation: *See*—
Mohaupt, Henry H., 4,064,935, Cl. 166-63.000.

King, George; and Hannon, James V., to Pak-A-Matic, Inc. Skin packaging machine with travelling vacuum frame. 4,064,676, Cl. 53-77.000.

King, Robert David; Hiscutt, Robert; and Molineux, Peter, to Triplex Safety Glass Company Limited. Metal oxide films. 4,065,600, Cl. 428-432.000.

King, William E.: *See*—
Wicks, Moye, III; Kubitschek, Hans E.; and King, William E., 4,064,572, Cl. 4-227.000.

Kinlaw, Joe C., to WindoWik Co. Condensate absorption and evaporation assembly. 4,064,666, Cl. 52-171.000.

Kinoshita, Keijiro, to Nissan Motor Co., Ltd. Transmission for single-shaft gas turbine engine. 4,064,958, Cl. 180-66.00A.

Kinoshita, Yoshiro, to Toray Industries, Inc. High tensile strength, high Young's modulus carbon fiber having excellent internal structure homogeneity, and process for producing the same. 4,065,549, Cl. 423-447.400.

Kirk, Donald C., Jr., to VCA Corporation. Actuator cap having a button rotatably between dispensing and non-dispensing positions. 4,065,036, Cl. 222-153.000.

Kisel, Martin W.: *See*—
Bussell, George W.; and Kisel, Martin W., 4,065,425, Cl. 260-33.6EP.

Kishimoto, Jyuji: *See*—
Mikada, Hiroyuki; and Kishimoto, Jyuji, 4,065,803, Cl. 361-88.000.

Kiss, Csaba: *See*—
Rakoczi, Jozsef; Beck, Ivan; Kiss, Csaba; Horvath, Imre; and Nemes, Miklos, 4,065,450, Cl. 260-239.00B.

Kiss, Kornel D., to Dart Industries, Inc. Electrical cables insulated with extraction resistant stabilized material. 4,065,635, Cl. 174-23.00R.

Kistler-Morse Corporation: *See*—
Kistler, Walter P., 4,064,744, Cl. 73-88.50R.

Kistler, Walter P., to Kistler-Morse Corporation. Strain sensorextensiometer. 4,064,744, Cl. 73-88.50R.

Kitagawa, Masahiro: *See*—
Maitani, Yoshihisa; Shimoyama, Kunio; Yoshida, Muneaki; Hashimoto, Akihiko; and Kitagawa, Masahiro, 4,065,777, Cl. 354-23.00R.

Klag, Gunther: *See*—
Spielberger, Georg; Wunderlich, Hermann; Klag, Gunther; and Zlokarnik, Marko, 4,065,492, Cl. 260-508.000.

Kluender, Harold Clinton, to Miles Laboratories, Inc. Depentyl analogues of 11-deoxy-prostaglandin E_1. 4,065,493, Cl. 260-514.00D.

Klusmann, Eugene B.: *See*—
Ditter, Jerome F.; and Klusmann, Eugene B., 4,065,509, Cl. 260-606.50B.

Klyver, Kenneth B.: *See*—
Schneider, John R.; and Klyver, Kenneth B., 4,065,390, Cl. 210-225.000.

Knape, Richard S.; and Lukas, Joseph, to General Motors Corporation. Fuel injection nozzle with compressible valve. 4,065,058, Cl. 239-88.000.

Knapheide Manufacturing Co., The: *See*—
Leaver, John Y. McLeish, 4,064,595, Cl. 16-128.00R.

Knight, Philip A., Jr., to Raytheon Company. Flat plate solar heat collector. 4,064,866, Cl. 126-271.000.

Knoell, Albert C.: *See*—
United States of America, National Aeronautics and Space Administration; Knoell, Albert C.; and Maxwell, Hugh G., 4,064,565, Cl. 3-1.900.

Kobayashi, Mikio; and Nakano, Isamu, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Method and apparatus for producing synthetic resin tube. 4,065,342, Cl. 156-203.000.

Kober, Marvin, to O.K. Machine and Tool Corporation. Wire strip, wrap and unwrap tool. 4,064,581, Cl. 7-14.10R.

Kobzina, John W., to Chevron Research Company. Herbicidal 1-(2-hydroxymethylpyrrolidinyl) carboxanilides. 4,065,291, Cl. 71-95.000.

Koch, Robert B., to Rilsan Corporation. Process for coating fine powders with a nylon and products made therewith. 4,065,519, Cl. 260-857.0TW.

Koehler, Charles. Pressure measuring device. 4,064,759, Cl. 73-409.000.

Koenig, Horst; Prinzbach, Horst; and Schwesinger, Reinhard, to BASF Aktiengesellschaft. 1,3-Didesoxy-1,3-[N,N'-(1',2',3',4'-tetrahydro-1',4'-dioxo)-phthalazino]-inositol compounds. 4,065,454, Cl. 260-250.00P.

Koenig, Ralph A., to John Zink Company. Method and apparatus for purifying blister furnace effluent. 4,065,110, Cl. 266-78.000.

Kohl, Robert F.: *See*—
Heian, Glenn A.; and Kohl, Robert F., 4,065,320, Cl. 106-100.000.

Kojima, Tatsuji: *See*—
Takahashi, Kooji; Kojima, Tatsuji; Ishikawa, Teruo; Nakamura, Kimio; and Ikenaga, Shizuyoshi, 4,065,598, Cl. 428-394.000.

Kokinda, James J.: *See*—
Collins, Jr.; Watson R.; and Kokinda, James J., 4,064,890, Cl. 137-73.000.

Kolthoff, Clyde Paul, Jr.; and Brennolt, Otto J., to International Harvester Company. Radiator air flow control mechanism. 4,064,934, Cl. 165-97.000.

Kominami, Hideyuki: *See*—
Mizukawa, Takumi; Nakamura, Masatatsu; Funakoshi, Kouzi; and Kominami, Hideyuki, 4,065,802, Cl. 361-18.000.

Kondo, Shinichi: *See*—
Umezawa, Hamao; and Kondo, Shinichi, 4,065,495, Cl. 260-534.00M.

Kondo, Yutaka: *See*—
Tanaka, Yutaka; Kondo, Yutaka; and Yamanaka, Akira, 4,065,156, Cl. 280-747.000.

Kondoh, Teruo; Ban, Kazuhiro; Kawamoto, Akio; Masuno, Yoshiki; and Yoshida, Mitsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Radar apparatus. 4,065,768, Cl. 343-9.000.

Konno, Masamitu: *See*—
Takahashi, Yutaka; Hakamata, Yoshio; and Konno, Masamitu, 4,064,677, Cl. 53-123.000.

Kono, Tatsuhiko: *See*—
Ohata, Katsuya; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, 4,065,562, Cl. 424-267.000.

Konrath, Karl: *See*—
Hofer, Gerald; Bofinger, Gunter; Nothdurft, Heinz; Khosrawi, Mohammad-Ali; Simon, Helmut; and Konrath, Karl, 4,065,236, Cl. 417-493.000.

Koppl, Franz; Griesshammer, Rudolf; and Hamster, Helmut, to Wacker-Chemitronic Gesellschaft fur Elektronik Grundstoffe mbH. Process for the continuous production of silicon rods or tubes by gaseous deposition into a flexible wound band. 4,065,533, Cl. 264-81.000.

Kori, Seiji: *See*—
Hayashi, Masaki; Kori, Seiji; Miyake, Hajimu; and Okada, Takanori, 4,065,632, Cl. 560-55.000.

Korkut, Mehmet D. Torsion spool. 4,065,101, Cl. 254-184.000.

Kornreich, Phillipp G.: *See*—
Kowel, Stephen T.; and Kornreich, Phillipp G., 4,065,791, Cl. 358-213.000.

Koroknay, Laszlo; and Urbantsok, Janos, to Autoipari Kutato Intezet. Anti-jack-knifing apparatus. 4,065,148, Cl. 280-432.000.

Kortusov, Leonid Ivanovich: *See*—
Grigorenko, Anatoly Sergeevich; Kravchenko, Vasily Savelievich; Moroz, Jury Antonovich; Kortusov, Leonid Ivanovich; and Vimba, Vladimir Ivanovich, 4,064,733, Cl. 72-453.030.

Kose, Shigeru. Coiled spring lock washer for socket bolts. 4,064,921, Cl. 151-38.000.

Koslin, Bertram L.: *See*—
Burstein, Albert H.; and Koslin, Bertram L., 4,064,567, Cl. 3-1.910.

Kostner, Armin: *See*—
Gerigk, Gunter; Bittner, Klaus-Jurgen; and Kostner, Armin, 4,064,673, Cl. 53-3.000.

Kowel, Stephen T.; and Kornreich, Phillipp G., to Research Corporation. Interaction of images with strain waves to derive Fourier transform components of the images. 4,065,791, Cl. 358-213.000.

Koziol, Konrad: *See*—
Zollner, Christine; Thiele, Gerhard; Zollner, Dieter; and Koziol, Konrad, 4,065,377, Cl. 204-290.00F.

Krapcho, John; and Turk, Chester F., to E. R. Squibb & Sons, Inc. 2-(2,2,2,-Trifluoroethyl)-3,3a,4,5,6,7-hexahydro-2H-pyrazolo[4,3-c]pyridines. 4,065,617, Cl. 542-450.000.

Krause, Erich, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Safety device for knitting machine. 4,064,710, Cl. 66-157.000.

Krause, Erich; and Schieber, Hans, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Safety stopping device for knitting machine. 4,064,711, Cl. 66-157.000.

Krautkramer-Branson, Incorporated: *See*—
Pittaro, Richard J., 4,064,742, Cl. 73-611.000.

Kravchenko, Vasily Savelievich: *See*—
Grigorenko, Anatoly Sergeevich; Kravchenko, Vasily Savelievich; Moroz, Jury Antonovich; Kortusov, Leonid Ivanovich; and Vimba, Vladimir Ivanovich, 4,064,733, Cl. 72-453.030.

Kreb, Robert J., III. Culturing syringe device. 4,065,360, Cl. 195-139.000.

Kretschmer, Felix: *See*—
Mukarovsky, Ladislav; Novak, Artur; and Kretschmer, Felix, 4,064,838, Cl. 119-14.080.

Krieg, Adrian H. Automatic torque controller for an impact wrench. 4,064,771, Cl. 81-52.300.

Kristof, Paul J.; and Rose, Frederick A., to Norland Corporation. Floating point registers for programmed digital instruments. 4,065,664, Cl. 364-487.000.

Kronogard, Sven-Olof, to United Turbine AB & Co. Gas turbine power plant. 4,064,690, Cl. 60-39.16R.

Krueger, Kenneth Keith: *See*—
Johnson, George Michael; Krueger, Kenneth Keith; and Pavlov, Todor, 4,064,882, Cl. 128-351.000.

Kubitschek, Hans E.: *See*—
Wicks, Moye, III; Kubitschek, Hans E.; and King, William E., 4,064,572, Cl. 4-227.000.

Kubota, Katsuyuki; Fujii, Noboru; Yamada, Kouichi; Nakamura, Kimikazu; and Yuuki, Norihito, to Sankyu Inc. Method for constructing a blast furnace. 4,064,616, Cl. 29-429.000.

Kuhl, Henry Y. Apparatus for drying plastic trays. 4,064,635, Cl. 34-58.000.

Kuiper, Ysbrand: *See*—
Dujardin, Esther; Kuiper, Ysbrand; Cremer, Rene; and Sironval, Cyrille, 4,065,310, Cl. 96-27.00R.

Kuist, Charles H.; Squitieri, Vincent; and Seeger, Richard E., to Chomerics, Inc. Isolated paths connector. 4,065,197, Cl. 339-17.00M.

Kuklin, Ivan Alexandrov: *See*—
Sendov, Stoyan Hristov; Nikolov, Ivan Angelov; Kuklin, Ivan Alexandrov; and Mirchev, Mircho Georgiev, 4,065,393, Cl. 210-377.000.

Kulkarni, Avinash D., to Westinghouse Electric Corporation. Regenerative-cycle incandescent lamp containing SnI_4 additive. 4,065,694, Cl. 313-222.000.

Kulsrud, Russell M.: *See*—
Jassby, Daniel L.; and Kulsrud, Russell M., 4,065,351, Cl. 176-5.000.

Kuntz, Emma: *See*—
Miller, Richard; Reich, Murray H.; and Kuntz, Emma, 4,065,537, Cl. 264-143.000.

Kunz, Paul. Apparatus for skinning or peeling produce such as fruits and vegetables. 4,064,794, Cl. 99-474.000.

Kurahashi, Yutaka. Article delivery and unloading device. 4,065,007, Cl. 214-62.00A.

Kurita Water Industries, Ltd.: *See*—
Tsuneki, Takao; Takahashi, Norio; and Tashiro, Hirohisa, 4,065,387, Cl. 210-62.000.

Kuroda, Nobuyuki: *See*—
Miyoshi, Mituji; Matsuura, Kazuo; Kuroda, Nobuyuki; and Ogawa, Shiro, 4,065,611, Cl. 526-124.000.

Kuroha, Jun: *See*—
Kawaguchi, Yoshihiko; Harada, Yoshimi; Miki, Makoto; Gouda, Kanenari; Akiyama, Masaharu; Tokura, Masayuki; and Kuroha, Jun, 4,065,419, Cl. 260-28.50D.

Kurowsky, Stephen R., to Pfizer Inc. Terpolymers of maleic anhydride and their use as scale control agents. 4,065,607, Cl. 526-15.000.

Kurt Matter GmbH K.G.: *See*—
Lehmann, Klaus Dieter, 4,064,899, Cl. 137-269.000.

Kurtz, Robert L., to United States of America, National Aeronautics and Space Administration. Projection system for display of parallax and perspective. 4,065,202, Cl. 350-3.500.

Kushall, Edward L.: *See*—
Wiggins, Douglas G.; and Kushall, Edward L., 4,065,031, Cl. 222-56.000.

Kuykendall, John L.: *See*—
Cvetko, Henry J.; and Kuykendall, John L., 4,065,134, Cl. 274-37.000.

Kyoei Steel Ltd.: *See*—
Nakamura, Shoji, 4,064,930, Cl. 164-82.000.

Kyto, Eero. Cover for the ignition carriage in a sintering plant. 4,065,111, Cl. 266-138.000.

L. A. Steelcraft Products, Inc.: *See*—
Germain, Stanley A., 4,065,099, Cl. 254-164.000.

Labana, Santokh S.; and Theodore, Ares N., to Ford Motor Company. Powder paint blend of epoxy and amide-functional copolymer and anhydride-functional copolymer. 4,065,518, Cl. 260-836.000.

Laboratoires Andre Guerbet: *See*—
Tilly, Guy; Hardouin, Michel Jean Charles; and Lautrou, Jean, 4,065,553, Cl. 424-5.000.
Tilly, Guy; Hardouin, Michel Jean Charles; and Lautrou, Jean, 4,065,554, Cl. 424-5.000.

Lachenmaier, Frank D.: *See*—
Earhart, John E.; Lachenmaier, Frank D.; and McConnell, John E., 4,065,740, Cl. 336-136.000.

Lachowicz, Donald R.; and Holder, Charles B., to Texaco Inc. Acrylate-butadiene graft copolymers and reinforced plastic compositions containing such copolymers. 4,065,521, Cl. 260-879.000.

Ladage, Lawrence; and Holste, Hilary E., to PPG Industries, Inc. Manufacture of alkylated urea or melamine formaldehyde with in-process alcohol recovery. 4,065,267, Cl. 23-263.000.

Laflamme, Daniel. Electronic music display device. 4,064,782, Cl. 84-477.00R.

Lafon, Victor. Sulphur containing arylamine derivatives. 4,065,584, Cl. 424-316.000.

LaForest, John P.: *See*—
Huffman, Jerry P.; LaForest, John P.; Petit, William A.; and Smith, James A., 4,065,081, Cl. 246-34.00R.

LaFrance Precision Casting Company: *See*—
Teti, Joseph A., Jr.; and Peroni, Peter A., 4,064,594, Cl. 16-125.000.

Laing, Nikolaus. Fusion-type thermal storage accumulator with discharging apparatus. 4,064,931, Cl. 165-1.000.

Lakah, Lucien: *See*—
Joullie, Maurice; Maillard, Gabriel; Lakah, Lucien; and Warolin, Christian Jean Marie, 4,065,575, Cl. 424-283.000.

Lake Center Industries: *See*—
Carter, Everett M.; and Quain, Wilbur C., 4,065,649, Cl. 200-5.00A.

Lakerveld, Herman Gerard; and Rietdijk, Johan Adriaan, to U.S. Philips Corporation. Rotary-anode X-ray tube. 4,065,674, Cl. 250-406.000.

Lampert, Ingolf, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for preparing haze free semiconductor surfaces and surfaces so made. 4,064,660, Cl. 51-283.00R.

Lane, John J.: *See*—
Croft, Edward F. B.; and Lane, John J., 4,065,251, Cl. 432-59.000.

Lange, Karl Heinz, to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co., KG. Camera with electronic flash device. 4,065,779, Cl. 354-145.000.

Langford, John R. F., to General Electric Company. Contamination removal method. 4,065,322, Cl. 134-7.000.

Langlois, Roland E., to Owens-Corning Fiberglas Corporation. Method and apparatus for removing particulate pollutants from stack gases. 4,065,274, Cl. 55-89.000.

Lansky, Zdenek J.: *See*—
Rich, Beldon Lee; and Lansky, Zdenek J., 4,064,788, Cl. 91-395.000.

Lapuyade, Robert Henri: *See*—
Godard, Pierre; and Lapuyade, Robert Henri, 4,065,712, Cl. 320-39.000.

Laridon, Urbain Leopold; Delzenne, Gerard Albert; Mader, Helmut; Ulrich, Hans; and Seidel, Bernhard, to AGFA-GEVAERT N.V. Film-forming light-sensitive polymeric material carrying azidosulfonyl groups. 4,065,524, Cl. 260-895.000.

Larock, Richard Craig, to Iowa State University Research Foundation, Inc. Method of synthesis of pi-allyl-palladium compounds. 4,065,479, Cl. 260-429.00L.

Larson, Robert L., to Regis Belt Maintenance Corporation. Method and apparatus for repairing conveyor belts. 4,064,775, Cl. 83-4.000.

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Latsch, Reinhard; and Bianchi, Valerio, to Robert Bosch GmbH. Method and apparatus for controlling an internal combustion engine. 4,064,846, Cl. 123-32.0EA.

Latvala, Bruce Earl: *See*—
Deem, Brian Charles; Markert, Matthew Edward; and Latvala, Bruce Earl, 4,064,973, Cl. 188-71.700.

Lauria, Francesco: *See*—
Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, 4,065,467, Cl. 260-345.200.

Lautrou, Jean: *See—*
Tilly, Guy; Hardouin, Michel Jean Charles; and Lautrou, Jean, 4,065,553, Cl. 424-5.000.
Tilly, Guy; Hardouin, Michel Jean Charles; and Lautrou, Jean, 4,065,554, Cl. 424-5.000.

Lavanish, Jerome M.: *See—*
Sare, Edward J.; and Lavanish, Jerome M., 4,065,543, Cl. 423-240.000.

Lavertu, Roger R.; and Godbout, Antonin, to United States of America, Army. Process for spheroidization of RDX crystals. 4,065,529, Cl. 264-3.00E.

Lavigne, Joe B., to Chevron Research Company. Lactones and ester derivatives thereof. 4,065,424, Cl. 260-31.8DB.

Lawlis, John L.; Rodgers, Bernard L.; and Winkowski, Daniel A., to National Gypsum Company. Facing sheet edge trimming. 4,065,333, Cl. 156-40.000.

Leach, George S., Jr.: *See—*
Reese, Edmund Arthur; Meyer, Charles Shelley; and Leach, George S., Jr., 4,065,678, Cl. 307-237.000.

Leach, Robert M.: *See—*
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,065,402, Cl. 252-358.000.
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Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,065,404, Cl. 252-358.000.

Leaming, Raymond C. Kit for cleaning tape cartridge playback unit. 4,065,801, Cl. 360-137.000.

Lear Siegler, Inc.: *See—*
Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., 4,065,222, Cl. 407-18.000.

Leaver, John Y. McLeish, to Knapheide Manufacturing Co., The. Metal door and hinge construction. 4,064,595, Cl. 16-128.00R.

Lechner, Helmut. Device attachable to power drills for removal of material released during drilling. 4,064,952, Cl. 175-209.000.

Lednicer, Daniel, to Upjohn Company, The. 4-Amino-4-phenylcyclohexanone ketal compositions and process of use. 4,065,573, Cl. 424-278.000.

Lee, Chen-Hsiung, to International Business Machines Corporation. Hybrid fluid jet drop generation. 4,065,774, Cl. 346-140.00R.

Lee, Chien-Ping: *See—*
Gover, Avraham; Samid, Ilan; and Lee, Chien-Ping, 4,065,729, Cl. 331-94.50H.

Lee, Don H.; Weller, Kenneth P.; Ying, Robert S.; and Thrower, William F., to Hughes Aircraft Company. Ion implantation process for fabricating high frequency avalanche devices. 4,064,620, Cl. 29-580.000.

Lee, Frank: *See—*
Coe, Gervase; and Lee, Frank, 4,065,257, Cl. 8-74.000.

Legrand, Richard Webster, to Hercules Incorporated. Thread forming and neck finishing process. 4,065,535, Cl. 264-94.000.

Lehmann, Klaus Dieter, to Kurt Matter GmbH K.G. Control and signal arrangement for respirators. 4,064,899, Cl. 137-269.000.

Leibinsohn, Saul, to Metatech Corporation. Pressure-indicating syringe. 4,064,879, Cl. 128-215.000.

Lemelson, Jerome H. Catapult launched model glider. 4,064,647, Cl. 46-81.000.

Lenard, William; and Taylor, Lynn J., to Owens-Illinois, Inc. Polymeric coating for protection of glass substrate. 4,065,589, Cl. 428-35.000.

Lened, Inc.: *See—*
Palmer, Leonard, 4,064,674, Cl. 53-23.000.

Lenke, Hans-Dieter: *See—*
Emig, Peter; Pohle, Hans; Scheffler, Gerhard; Brock, Norbert; Lenke, Hans-Dieter; and Pohl, Jorg, 4,065,501, Cl. 260-570.600.

L'Eplattenier, Francois; and Vuitel, Laurent, to Ciba-Geigy Corporation. 1:1-Azomethine-metal-complex dyestuffs. 4,065,481, Cl. 260-438.100.

Leroy, Maurice; and Helgorsky, Jacques, to Rhone-Poulenc Industries. Method of defluorinating phosphoric acid. 4,065,547, Cl. 423-321.00S.

Leroy, Pierre; and Sprunck, Emile, to Sprunck, E.; and Creusot-Loire. Rotary connector. 4,065,159, Cl. 285-136.000.

Leshner, Ervin; and Leshner, Michael D., to Fuel Injection Development Corporation. Power indicating means and method for an internal combustion engine. 4,064,748, Cl. 73-117.300.

Leshner, Michael D.: *See—*
Leshner, Ervin; and Leshner, Michael D., 4,064,748, Cl. 73-117.300.

Leskovec, Edward V.; and Porter, Ralph D., to Towmotor Corporation. Hydraulic jack cushioning apparatus. 4,065,112, Cl. 267-34.000.

Letourneur, Jean-Claude; and Jean, Pierre, to GAZ-Transport. Fluid-tight isothermal tank for liquefied gas. 4,065,019, Cl. 220-9.0LG.

Leucht, Rainer: *See—*
Fabian, Frank-Dietrich; and Leucht, Rainer, 4,065,170, Cl. 296-37.100.

Lever Brothers Company: *See—*
Brouwer, Hendrik Willem, 4,065,398, Cl. 252-108.000.
Miles, John J., Jr.; and Netzbandt, William, 4,065,564, Cl. 424-66.000.

Levine, Beth, to Betherb, Inc. Footwear. 4,064,641, Cl. 36-1.500.

Levine, Fred. Shaft adapter. 4,065,219, Cl. 403-287.000.

Lewin, Ian: *See—*
Ruud, Alan J.; and Lewin, Ian, 4,065,667, Cl. 362-217.000.

Lewin, John Edward, to Shiley Laboratories, Inc. Blood oxygenator with integral heat exchanger for regulating the temperature of blood in an extracorporeal circuit. 4,065,264, Cl. 23-258.5BH.

Li, Tsung-tee; Marx, Michael; and Throop, Lewis J., to Syntex (U.S.A.) Inc. 21,21-Dihalo steroids. 4,065,452, Cl. 260-239.55D.

Liberty Vinyl Corporation: *See—*
Winther, Howard Allyn, 4,064,579, Cl. 5-371.000.

Lichtenwald, Roger A., to American Warming and Ventilating Inc. Rainproof louver. 4,064,670, Cl. 52-473.000.

Liebe, Werner: *See—*
Weyde, Edith; von Konig, Anita; and Liebe, Werner, 4,065,312, Cl. 96-50.00R.

Liebman, Theodore. D. C. powered strobe light. 4,065,700, Cl. 315-241.00R.

Life Savers, Inc.: *See—*
Mackay, Donald A. M.; and Schoenholz, Daniel, 4,065,579, Cl. 426-3.000.
Reggio, Richard A.; Friello, Dominick R.; and Beam, John E., 4,065,578, Cl. 426-3.000.

Lillis, William Joseph; and Henry, Paul Mike, to Motorola, Inc. Gain control circuit. 4,065,725, Cl. 330-254.000.

Lindberg, Richard W.: *See—*
Meier, Michael J.; Adams, Edward C.; and Lindberg, Richard W., 4,065,788, Cl. 358-166.000.

Lindeberg, Sven-Erik: *See—*
Lundkvist, Bror Ludvig; Lindeberg, Sven-Erik; and Forsberg, Karl Sievert, 4,065,652, Cl. 200-175.000.

Linden-Alimak AB: *See—*
Andersson, Rickard, 4,064,615, Cl. 29-426.000.

Lindenberg, Hans-Georg; Illmann, Joachim; and Golz, Hans-Joachim, to Varta Batterie Aktiengesellschaft. Clamping of battery plate block assemblies. 4,065,116, Cl. 269-22.000.

Lindgren, Stig Rune, to AB Svenska Flaktfabriken. Cylinder dryer for paper machines. 4,064,637, Cl. 34-122.000.

Linke, Gerhard: *See—*
Ruhrnschopf, Ernst-Peter; and Linke, Gerhard, 4,065,397, Cl. 250-445.00T.

Lipe, Gordon C.: *See—*
Weinstein, Burton A.; and Lipe, Gordon C., 4,065,151, Cl. 280-618.000.

Lipkins, Morton S. Lateral transfer retroreflectors. 4,065,204, Cl. 350-102.000.

Lippert, Axel; Joisten, Siegfried; and Sajben, Johannes-Otto, to Bayer Aktiengesellschaft. Process for producing fibre reinforced plastic tubes with flanges. 4,065,339, Cl. 156-149.000.

Lipson, Melvin A.: *See—*
Yamazaki, Toshio; Cook, Harriet J.; and Lipson, Melvin A., 4,065,315, Cl. 96-48.0QP.

Litzenberg, David P. Motor driven pump. 4,065,231, Cl. 417-357.000.

Lo, Wayne, to General Motors Corporation. Cadmium diffused $Pb_{1-x}Sn_xTe$ diode laser. 4,064,621, Cl. 29-569.00L.

Loch, Emil P., to Westinghouse Electric Corporation. Method of positioning an explosive insert in a vertical tube. 4,064,618, Cl. 29-451.000.

Locker, Daniel; and Miller, Moshe. Drive system for high inertia load. 4,065,702, Cl. 318-161.000.

Loe, Winston C. Combination needle flow control and shut-off valve for precision instruments. 4,064,908, Cl. 137-614.170.

Loftus, John T.: *See—*
Shwayder, Warren M.; and Loftus, John T., 4,064,716, Cl. 70-38.00A.

Logan, Dexter J. Sanitary tubular napkin for males. 4,064,880, Cl. 128-294.000.

Logothétis, Anestis Leonidas, to Du Pont de Nemours, E. I., and Company. Alternating copolymers of alkyl acrylate/ethylene/-branching agents. 4,065,613, Cl. 526-292.000.

Londahl, Dickey Steele: *See—*
Furlong, Donn Breen; and Londahl, Dickey Steele, 4,065,235, Cl. 417-420.000.

London, Arnold, to Motorola, Inc. Amplitude and phase programmable acoustic surface wave matched filter. 4,065,736, Cl. 333-72.000.

Long, Don Wesley: *See—*
Reger, David William; Garber, Murray; and Long, Don Wesley, 4,065,466, Cl. 260-327.00M.

Loos & Schmidt Wilhelm Loos GmbH: *See—*
Loos, Wilhelm, 4,064,585, Cl. 10-130.0WH.

Loos, Wilhelm, to Loos & Schmidt Wilhelm Loos GmbH. Thread cutting machine. 4,064,585, Cl. 10-130.0WH.

L'Oreal: *See—*
Andrillon, Patrick; and Bugaut, Andree, 4,065,255, Cl. 8-10.200.

Lorincz, Csaba; Szasz, Kalman; Bolyos, Maria; Jovanovics, Karola; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, to Richter Gedeon Vegyeszeti Gyar Rt. Eburnamenine derivatives. 4,065,458, Cl. 260-293.550.

Lorson, Pierre Michel; and Dumas, Bernard Roger, to Societe Nationale des Poudres et Explosifs. Hybrid propellant compositions. 4,065,332, Cl. 149-19.900.

Lou, Kwong-Li. Electronic calculator with switches in solid V- and U-shaped groups. 4,065,650, Cl. 200-5.00R.

Loveless, Frederick C.: *See—*
Farber, Milton; Loveless, Frederick C.; and Peterson, Robert F., Jr., 4,064,922, Cl. 152-347.000.

Lowe Alpine Systems, Inc.: *See—*
Lowe, Greg E.; and Lowe, Michael R., 4,064,665, Cl. 52-155.000.

Lowe, Greg E.; and Lowe, Michael R., to Lowe Alpine Systems, Inc. Ice anchoring method and device. 4,064,665, Cl. 52-155.000.

Lowe, Michael R.: *See—*
Lowe, Greg E.; and Lowe, Michael R., 4,064,665, Cl. 52-155.000.

Lucas Industries Limited: *See—*
Glaze, Stanley George, 4,065,154, Cl. 280-707.000.
Moore, Alan Raymond, 4,065,686, Cl. 310-68.00D.

Lucas, Malcolm Bramel, to Procter & Gamble Company, The. Method of making a precisely partitioned bulbous-shape container. 4,065,536, Cl. 264-98.000.

Ludwig, George C., to Bendix Corporation, The. Vacuum reducer valve. 4,064,894, Cl. 137-116.500.

Luh, Bing Yu: *See—*
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., 4,065,623, Cl. 544-105.000.

Lukas, Joseph: *See—*
Knape, Richard S.; and Lukas, Joseph, 4,065,058, Cl. 239-88.000.

Lundkvist, Bror Ludvig; Lindeberg, Sven-Erik; and Forsberg, Karl Sievert, to Telefonaktiebolaget L M Ericsson. Contact assembly and mounting structure for cross bar selector switch. 4,065,652, Cl. 200-175.000.

Lundmark, Larry D.; Meiby, Allan; and Chun, Ho-ming, to General Mills Chemicals, Inc. High slip polymer composition containing a polyacrylamido sulfonic acid salt and an alcohol. 4,065,422, Cl. 260-29.60E.

Lundquist, Ingemar H., to Syntex Puerto Rico, Inc. Inhalation device. 4,064,878, Cl. 128-206.000.

Lupinski, John H.; Boldebuck, Edith M.; and Barnes, Wilson J., to General Electric Company. Method for making aqueous polyimide electrocoating mixtures. 4,065,420, Cl. 260-29.20N.

Lurie, Mikhail Vladimirovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Lurie, Mikhail Vladimirovich; Topolyansky, Jury Arnoldovich; Kantor, Ilya Solomonovich; Chizhikov, Anatoly Petrovich; and Gun, Dmitry Rudolfovich, 4,065,076, Cl. 243-38.000.

Lussiez, Guy W.; and Reid, Hugh F., to Amax Inc. Fluidizing means for reducing viscosity of slurries. 4,065,105, Cl. 366-348.000.

Lydiksen, George C., to Simplex Filler Company. Container-filling machine with fill adjustment during operation. 4,065,032, Cl. 222-77.000.

Lyon, LaVerne D.: *See—*
November, Milton H.; and Lyon, LaVerne D., 4,064,739, Cl. 73-32.00A.

Machinefabriek W. Hubert & Co. B.V.: *See—*
Sinnema, Hendrik, 4,065,238, Cl. 425-94.000.

MacInnis, Martin B.; and Quatrini, L. Rita, to GTE Sylvania Incorporated. Fire resistance wood-based boards, process for producing same and compositions useful therefor. 4,065,413, Cl. 260-9.000.

Mackay, Donald A. M.; and Schoenholz, Daniel, to Life Savers, Inc. Long-lasting flavored chewing gum including chalk-containing gum base. 4,065,579, Cl. 426-3.000.

MacKay, Kenneth D.; and Rogier, Edgar R., to General Mills Chemicals, Inc. Certain β-diketones and the use thereof as metal extractants. 4,065,502, Cl. 260-590.00R.

MacLean-Fogg Lock Nut Company: *See—*
Oaks, Daniel V., 4,064,617, Cl. 29-432.100.

MacLean, John P.; and Strickland, John C., to Texaco Inc. Instrument assembly. 4,064,756, Cl. 73-349.000.

MacMaster, Edward, to Rexnord Inc. Container or panel clamp. 4,065,161, Cl. 292-113.000.

Maddock, William Harvard, to Standard Modern Tool Company Limited. Work handling apparatus for center drive lathe. 4,064,774, Cl. 82-45.000.

Mader, Helmut: *See—*
Laridon, Urbain Leopold; Delzenne, Gerard Albert; Mader, Helmut; Ulrich, Hans; and Seidel, Bernhard, 4,065,524, Cl. 260-895.000.

Madison, Vernon Edwin: *See—*
Riegelman, Harry M.; and Madison, Vernon Edwin, 4,064,592, Cl. 16-100.000.

Maeda, Riichi. Centrifugal blasting apparatus. 4,064,661, Cl. 51-424.000.

Maekawa, Yuzo: *See—*
Yasuda, Tetsuya; Iinuma, Yoshio; Maekawa, Yuzo; Kato, Toshikiyo; and Yoshida, Masaru, 4,064,689, Cl. 58-50.00R.

Maeyama, Shigeo, to Tokyo Shibaura Electric Co., Ltd. X-ray tube with a control grid. 4,065,690, Cl. 313-57.000.

Maffrand, Jean-Pierre: *See—*
Heymes, Alain; and Maffrand, Jean-Pierre, 4,065,460, Cl. 260-294.80C.
Heymes, Alan; and Maffrand, Jean-Pierre, 4,065,459, Cl. 260-294.80C.

Magerlein, Barney J., to Upjohn Company, The. 17-Phenyl-18,19,20-trinor-cis-4,5-didehydro-PGE, compounds. 4,065,628, Cl. 560-53.000.

Magerlein, Barney J., to Upjohn Company, The. 17-Phenyl-18,19,20-trinor-cis-4,5-didehydro-PGA_1 compounds. 4,065,629, Cl. 560-5.00B.

Magerlein, Barney J., to Upjohn Company, The. 17-Phenyl-18,19,20-trinor-cis-4,5-didehydro-$PGF_{1\alpha}$ compounds. 4,065,631, Cl. 560-55.000.

Magerramova, Zemfira Jusif kyzy: *See—*
Rizaev, Ramiz Gasan Kuli ogly; Mekhtiev, Soltan Dzhafarovich; Magerramova, Zemfira Jusif kyzy; Sheinin, Viktor Efimovich; Mirataev, Mirabdulla Mirakhmed ogly; and Guseinov, Idris Aslan ogly, 4,065,487, Cl. 260-465.00C.

Magers, Wallace Farnholm; Hudson, Larry Lee; and Workman, James Phillip, to Realex Corporation. Pump sprayer. 4,065,038, Cl. 222-321.000.

Maguer, Pierre; and Verveur, Jean, to Etat Francais represente par le Delegue Ministeriel pour l'Armement. Transmitting and receiving multipath sonar antenna utilizing a single acoustic lens. 4,065,748, Cl. 340-9.000.

Magyar, Joseph J., to General Motors Corporation. Seat belt retractor with winding prevention mechanism. 4,065,072, Cl. 242-107.700.

Mahle, Howard C.; and Thomas, Harris B., to Todd & Sargent, Inc.; and Nott Company, part interest to each. Device for loading railroad cars from a grain storage complex. 4,065,005, Cl. 214-41.00R.

Maiese, William M.; and Wax, Richard G., to Merck & Co., Inc. Production of antibiotic FR-02A (efrotomycin) by streptomyces lactamdurans. 4,065,356, Cl. 195-80.00R.

Maietti, Francesca: *See—*
Connizzoli, Mario; Peviani, Camillo; and Maietti, Francesca, 4,064,707, Cl. 62-374.000.

Maillard, Gabriel: *See—*
Joullie, Maurice; Maillard, Gabriel; Lakah, Lucien; and Warolin, Christian Jean Marie, 4,065,575, Cl. 424-283.000.

Mains, Harold E.: *See—*
Foulks, Harold C., Jr.; Rodenberg, Herbert G.; and Mains, Harold E., 4,065,418, Cl. 260-23.0XA.

Maitani, Yoshihisa; Shimoyama, Kunio; Yoshida, Muneaki; Hashimoto, Akihiko; and Kitagawa, Masahiro, to Olympus Optical Company, Ltd. Photometric apparatus for single lens reflex camera. 4,065,777, Cl. 354-23.00R.

Maklad, Mokhtar S.: *See—*
Kao, Charles K.; Goell, James E.; and Maklad, Mokhtar S., 4,065,280, Cl. 65-3.00A.

Malec, Robert E., to Ethyl Corporation. Lubricant additive. 4,065,499, Cl. 260-567.60M.

Malecha, Richard J.: *See—*
Soulsby, John E.; and Malecha, Richard J., 4,064,903, Cl. 137-375.000.

Maloney, Bernard A.: *See—*
Rechlicz, Thomas A.; and Maloney, Bernard A., 4,065,534, Cl. 264-91.000.

Maloney, John Vincent. Adaptable flush attachment for marine engines having side cooling water ports. 4,065,325, Cl. 134-167.00R.

Maltby, Frederick L.: *See—*
Sun, Robert J.; and Maltby, Frederick L., 4,064,753, Cl. 73-304.00C.

Manetta, John A.: *See—*
Gunlock, Donald E.; and Manetta, John A., 4,065,181, Cl. 297-452.000.

Mang, Raymond L.; and Carr, Thomas W., to PPG Industries, Inc. Method of tempering glass sheets of unequal thickness. 4,065,284, Cl. 65-114.000.

Manlove, James C.: *See—*
Allyn, Charles L.; Manlove, James C.; Chang, Gerald M.; and Burmark, Robert C., 4,065,421, Cl. 260-29.40R.

Mannesmann Aktiengesellschaft: *See—*
Gerretz, Richard, 4,064,730, Cl. 72-393.000.

Mano, Kenji: *See—*
Amano, Tadashi; Kawano, Susumu; Mano, Kenji; and Irisawa, Takaji, 4,064,727, Cl. 72-179.000.

Manriquez, Ralph F., to International Computers Limited. Demountable bearing and shaft assembly. 4,065,638, Cl. 178-23.00R.

Mansfield, Henry Timothy. Functional apparatus aid. 4,064,625, Cl. 30-90.000.

Mantz, David. Practice tennis ball and apparatus. 4,065,126, Cl. 273-58.00A.

Marcus, Paul. Injection blow molding apparatus. 4,065,246, Cl. 425-528.000.

Marek, Donald C.: *See—*
Smith, Spencer E.; and Marek, Donald C., 4,064,768, Cl. 74-528.000.

Marforio, Nerino, to Rockwell-Rimoldi S.p.A. Sewing machine base. 4,064,818, Cl. 112-258.000.

Margotte, Dieter: *See—*
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; and Nouvertne, Werner, 4,065,436, Cl. 260-47.0XA.

Marine Construction & Design Co.: *See—*
McGrew, Jay L., 4,065,389, Cl. 210-96.00R.

Markert, Matthew Edward: *See—*
Deem, Brian Charles; Markert, Matthew Edward; and Latvala, Bruce Earl, 4,064,973, Cl. 188-71.700.

Marlow, Donald R.: *See—*
Gulick, Joseph F.; and Marlow, Donald R., 4,065,771, Cl. 343-100.0SA.

Marquis, Gerald L., to Dresser Industries, Inc. Method and apparatus for running and retrieving logging instruments in highly deviated well bores. 4,064,939, Cl. 166-253.000.

Marsek, Richard V.: *See—*
Morgan, Robert H., 4,064,721, Cl. 70-416.000.

Martin, Richard L.; and French, Eddie C., to Petrolite Corporation. Hydrogen patch cell. 4,065,373, Cl. 204-195.00C.

Martin, Richard Thomas, Jr.; and Engert, David Michael. Board game apparatus. 4,065,131, Cl. 273-134.00B.

Martinez, D. Manuel Torres. System for automatic coupling or splicing of bobbins, submitting a strip to a continuous feed process for paper manufacturing machines. 4,065,067, Cl. 242-58.100.

Martz, Lyle F., to Westinghouse Electric Corporation. Boiler control providing improved operation with fuels having variable heating values. 4,064,699, Cl. 60-664.000.

Maruyama, Haruyoshi: *See—*
Nakaya, Akira; and Maruyama, Haruyoshi, 4,065,276, Cl. 55-276.000.

Maruyama, Isamu: *See*—
Sasajima, Kikuo; Ono, Keiichi; Nakao, Masaru; Maruyama, Isamu; Katayama, Shigenari; Inaba, Shigeho; and Yamamoto, Hisao, 4,065,565, Cl. 424-250.000.

Marx, Michael: *See*—
Li, Tsung-tee; Marx, Michael; and Throop, Lewis J., 4,065,452, Cl. 260-239.55D.

Maschinenfabrik Hennecke GmbH: *See*—
Althausen, Ferdinand; and Raffel, Reiner, 4,065,106, Cl. 366-76.000.

Mashita, Masao: *See*—
Takeno, Shouzo; Mashita, Masao; and Onodera, Toshihiro, 4,065,734, Cl. 333-30.00R.

Massey-Ferguson Inc.: *See*—
Worback, David L., 4,065,010, Cl. 214-138.00D.

Massey-Ferguson Services N.V.: *See*—
Old, John L., 4,065,009, Cl. 214-131.00A.

Masui, Akira; Yamada, Kenzo; Ninomiya, Akinori; Tachibana, Katsuhiko; and Kato, Yoshihiro, to Nippon Kokan Kabushiki Kaisha. Steel making process by oxygen top-blown converter. 4,065,298, Cl. 75-60.000.

Masumoto, Hakaru; and Murakami, Yuetsu, to Foundation: The Research Institute of Electric and Magnetic Alloys, The. Wear-resistant high-permeability alloy. 4,065,330, Cl. 148-31.550.

Masuno, Yoshiki: *See*—
Kondoh, Teruo; Ban, Kazuhiro; Kawamoto, Akio; Masuno, Yoshiki; and Yoshida, Mitsuhiro, 4,065,768, Cl. 343-9.000.

Matsumoto, Junichiro; Iizuka, Haruhiko; and Kato, Fumiaki, to Nissan Motor Co., Ltd. Apparatus and method for successively inactivating the cylinders of an electronically fuel-injected internal combustion engine in response to sensed engine load. 4,064,844, Cl. 123-32.0EA.

Matsumoto, Mitsuo, to Tokyo Shibaura Electric Co., Ltd. Multi-processing system for controlling microcomputers and memories. 4,065,809, Cl. 364-200.000.

Matsuo, Tohru: *See*—
Sasaki, Kantaro; Ikeda, Takami; Matsuo, Tohru; and Okazaki, Takashi, 4,065,297, Cl. 75-52.000.

Matsuoka, Takeji. Coil actuating apparatus in a coil spring making machine. 4,064,732, Cl. 72-449.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Inoue, Toshitugu; Nakamura, Takuji; Onoda, Tadayuki; and Nakatugawa, Tatuo, 4,065,792, Cl. 358-286.000.
Mizukawa, Takumi; Nakamura, Masatatsu; Funakoshi, Kouzi; and Kominami, Hideyuki, 4,065,802, Cl. 361-18.000.
Nishino, Atsushi; Sonetaka, Kazunori; and Kimura, Kunio, 4,065,406, Cl. 252-443.000.
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, 4,065,797, Cl. 360-113.000.
Torigoe, Masao; Mori, Kunihito; Tsuchiya, Mitsuru; and Takemura, Seiji, 4,065,233, Cl. 417-368.000.

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Mattia, Armand D. Pulpit elevating and lowering system. 4,065,194, Cl. 312-247.000.

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Nakagawa, Yasuhiko; Sasaki, Masahiro; Ito, Teruyuki; and Matuoka, Tosimitu, 4,064,850, Cl. 123-75.00B.

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Bailey, Frederick Eugene; von Dohlen, Werner Claus; Matzner, Markus; Young, Robert Hayward; and Robeson, Lloyd Mahlon, 4,065,520, Cl. 260-878.00B.

Mauney, Harold D. Clip assembly for ceiling track railings. 4,065,090, Cl. 248-318.000.

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May, Ralph Forrest, to Du Pont de Nemours, E. I., and Company. Inhibition of crystallization of O-ethyl-O-(4-nitrophenyl)-phenylphosphonothioate. 4,065,525, Cl. 260-989.000.

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Cummings, Thomas R.; and Mazza, Anthony J., Jr., 4,064,640, Cl. 35-12.00K.

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McBride, Edward D., to Outboard Marine Corporation. Flywheel assembly ring gear guard. 4,064,765, Cl. 74-6.000.

McBride, Stuart Livingstone: *See*—
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McCabe, Frank A.: *See*—
Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., 4,065,222, Cl. 407-18.000.

McCaully, Ronald J.; Nudelman, Abraham; and Bell, Stanley C., to American Home Products. 1,3-Dihydro-3-hydroxy-5-phenyl-2H-1,4-benzodiazepin-2-one, substituted diamino acetate esters and their acid salts. 4,065,451, Cl. 260-239.30D.

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Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, 4,064,725, Cl. 72-147.000.

McClure, James D.; and Brandenberger, Stanley G., to Shell Oil Company. Alkane isomerization process using a supported perfluorinated polymer catalyst. 4,065,515, Cl. 260-683.680.

McClure, L. C. Chemical treating system for oil wells. 4,064,936, Cl. 166-75.00R.

McClure, William C. Message signaling and alerting system and method thereof. 4,065,642, Cl. 179-18.00B.

McClure, William F.; and Brown, David L. Apparatus for fire extinguishing system for floating-roof tanks. 4,064,944, Cl. 169-60.000.

McConnell, John E.: *See*—
Earhart, John E.; Lachenmaier, Frank D.; and McConnell, John E., 4,065,740, Cl. 336-136.000

McCullough, John E., to Arthur D. Little, Inc. Scroll-type apparatus with hydrodynamic thrust bearing. 4,065,279, Cl. 62-510.000.

McDonnell Douglas Corporation: *See*—
Meier, Michael J.; Adams, Edward C.; and Lindberg, Richard W., 4,065,788, Cl. 358-166.000.

McGraw-Edison Company: *See*—
Yount, Ronald E.; and Bell, Robert A., 4,065,659, Cl. 219-398.000.

McGrew, Jay L., to Marine Construction & Design Co. Apparatus for detecting proportion of oil in oil/water mixtures. 4,065,389, Cl. 210-96.00R.

McIntosh Laboratory, Inc.: *See*—
Evans, Ronald C., 4,065,682, Cl. 307-261.000.

McKee Bros. Limited: *See*—
Heslop, Lorne C., 4,065,062, Cl. 241-101.700.

McKenna, Patrick J.: *See*—
Bergman, John E.; Keeler, William T.; and McKenna, Patrick J., 4,064,658, Cl. 51-110.000.

McMillan, William D., to Caterpillar Tractor Co. Hydraulic control for variable displacement pumps. 4,065,228, Cl. 417-212.000.

McMurdo Instrument Company Limited, The: *See*—
Casson, William Ernest, 4,065,606, Cl. 429-198.000.

McVey, Charles I., to General Electric Company. Ceramic lamp having electrodes supported by crimped tubular inlead. 4,065,691, Cl. 313-174.000.

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Gosling, Alexander Benett; and Mealing, Barrie Ewart, 4,065,706, Cl. 318-254.000.

Megowen, William J.; and Cohen, Harvey M., to Megowen, William J. Closure means and method. 4,065,018, Cl. 215-231.000.

Meier, Hans, to Joh. Vaillant KG. Circulating water heater. 4,065,054, Cl. 237-8.00R.

Meier, Michael J.; Adams, Edward C.; and Lindberg, Richard W., to McDonnell Douglas Corporation. Realtime image processor. 4,065,788, Cl. 358-166.000.

Meister, Pierre-Andre: *See*—
Erni, Bruno; and Meister, Pierre-Andre, 4,065,651, Cl. 200-5.00A.

Mekhtiev, Soltan Dzhafarovich: *See*—
Rizaev, Ramiz Gasan Kuli ogly; Mekhtiev, Soltan Dzhafarovich; Magerramova, Zemfira Jusif kyzy; Sheinin, Viktor Efimovich; Mirataev, Mirabdulla Mirakhmed ogly; and Guseinov, Idris Aslan ogly, 4,065,487, Cl. 260-465.00C.

Melby, Allan: *See*—
Lundmark, Larry D.; Melby, Allan; and Chun, Ho-ming, 4,065,422, Cl. 260-29.60E.

Mendoza, Vicente A.: *See*—
Straitz, John F., III; and Mendoza, Vicente A., 4,065,248, Cl. 431-202.000.

Mercik, Henry J., Jr.; and Armstrong, Lee R., to United Technologies Corporation. Parameter controlled speed determination in internal combustion engine diagnostics. 4,064,746, Cl. 73-116.000.

Merck & Co., Inc.: *See*—
Atkinson, Joseph George; Rooney, Clarence Stanley; Girard, Yves; and Engelhardt, Edward L., 4,065,572, Cl. 424-273.00R.
Denny, George H.; and Saari, Walfred S., 4,065,464, Cl. 260-326.150.
Denny, George H., 4,065,465, Cl. 260-326.150.
Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,065,497, Cl. 260-563.00P.
Hurni, William M., 4,065,359, Cl. 195-127.000.
Maiese, William M.; and Wax, Richard G., 4,065,356, Cl. 195-80.00R.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Steinstrasser, Rolf; and Del Pino, Fernando, 4,065,489, Cl. 560-59.000.

Meredith, Hayden Gwyn, to Rocket of London Limited. Surgical clip applicator. 4,064,881, Cl. 128-325.000.

Merila, John B. Paper napkin dispenser. 4,065,028, Cl. 221-36.000.

Merrill, Cleon C.: *See*—
Borgen, Arden L.; and Merrill, Cleon C., 4,064,895, Cl. 137-216.000.

Merz, Kenneth M.: *See—*
Wahlers, Richard L.; and Merz, Kenneth M., 4,065,743, Cl. 338-308.000.
Meshulam, Avram; and Rebold, Jerome L., to CBS Inc. Cutter for sheet material. 4,064,626, Cl. 30-287.000.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Seilstorfer, Helmut; Wittich, Willibald, deceased; and Messerschmitt-Bolkow-Blohm GmbH, legal representative, 4,065,303, Cl. 75-226.000.
Messerschmitt-Bolkow-Blohm GmbH, legal representative: *See—*
Seilstorfer, Helmut; Wittich, Willibald, deceased; and Messerschmitt-Bolkow-Blohm GmbH, legal representative, 4,065,303, Cl. 75-226.000.
Messinger Bearings, Inc.: *See—*
Sague, John E., 4,065,192, Cl. 308-215.000.
Mesur-Matic Electronics Corporation: *See—*
Newell, Harold R., 4,065,685, Cl. 310-49.00R.
Metaframe Corporation: *See—*
Rodemeyer, Donald James; and Hruby, John Eugene, 4,064,839, Cl. 119-15.000.
Metallgesellschaft Aktiengesellschaft: *See—*
Rudolph, Paul, 4,065,273, Cl. 55-50.000.
Weckesser, Ernst; Sparwald, Volker; Reh, Lothar; Bohm, Eberhard; and Graf, Rolf, 4,065,271, Cl. 55-2.000.
Metatech Corporation: *See—*
Leibinsohn, Saul, 4,064,879, Cl. 128-215.000.
Metex Corporation: *See—*
Severinsen, John, 4,065,138, Cl. 277-230.000.
Methode Electronics, Inc.: *See—*
Andre, Michael G.; Schmidt, Melvin J.; and Osman, Kenneth L., 4,065,199, Cl. 339-17.00F.
Metzeler Schaum GmbH: *See—*
Brendel, Hugo; and Federau, Heinz, 4,065,245, Cl. 425-503.000.
Meyer, Charles Shelley: *See—*
Reese, Edmund Arthur; Meyer, Charles Shelley; and Leach, George S., Jr., 4,065,678, Cl. 307-237.000.
Micheron, Francois; Doriath, Gerard; and Spitz, Eric, to Thomson-CSF. Electrically controlled switching device. 4,065,677, Cl. 307-112.000.
Micheron, Francois: *See—*
Mayeux, Christian; Micheron, Francois; and Vasseur, Jean Pierre, 4,065,671, Cl. 250-370.000.
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Harrison, Arthur Michael, 4,064,758, Cl. 73-398.0AR.
Midland-Ross Corporation: *See—*
Hemsath, Klaus H.; and Vereecke, Frank J., 4,065,252, Cl. 432-77.000.
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Cramer, Robert L.; Dunbar, Jack E.; and Mientus, James A., 4,064,875, Cl. 128-142.200.
Mihirogi, Kiyoshi: *See—*
Nakamura, Shinji; and Mihirogi, Kiyoshi, 4,064,808, Cl. 104-148.0MS.
Mikada, Hiroyuki; and Kishimoto, Jyuji, to Canon Kabushiki Kaisha. Electronic device for preventing undesirable effect resulting from voltage fluctuation. 4,065,803, Cl. 361-88.000.
Miki, Makoto: *See—*
Kawaguchi, Yoshihiko; Harada, Yoshimi; Miki, Makoto; Gouda, Kanenari; Akiyama, Masaharu; Tokura, Masayuki; and Kuroha, Jun, 4,065,419, Cl. 260-28.50D.
Milburn, Ralph N. Vacuum contact printer. 4,065,210, Cl. 355-91.000.
Miles, Barry Donald Ruberry: *See—*
Owen, David Peter; and Miles, Barry Donald Ruberry, 4,065,787, Cl. 358-160.000.
Miles, John J., Jr.; and Netzbandt, William, to Lever Brothers Company. Antiperspirant solution containing a substantially non-volatile siloxane liquid. 4,065,564, Cl. 424-66.000.
Miles Laboratories, Inc.: *See—*
Kluender, Harold Clinton, 4,065,493, Cl. 260-514.00D.
Miley, Frederick: *See—*
Jenkins, Stanley Frederick Noel; Fairclough, Roy; Howard, Brian Arthur; and Miley, Frederick, 4,065,078, Cl. 244-104.0FP.
Miller, Charles G.: *See—*
Fletcher, James C.; Miller, Charles G.; and Stephens, James B., 4,065,053, Cl. 237-1.00A.
Miller-Holzwarth, Inc.: *See—*
Tausch, Gerald, 4,065,206, Cl. 350-301.000.
Miller, Homer R.: *See—*
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Miller, Moshe: *See—*
Locker, Daniel; and Miller, Moshe, 4,065,702, Cl. 318-161.000.
Miller, Richard; Reich, Murray H.; and Kuntz, Emma, to Princeton Chemical Research, Inc. Process for producing molded golf balls exhibiting isometric compression. 4,065,537, Cl. 264-143.000.
Miller, Richard H., to PPG Industries, Inc. Process for removing acetylene from hydrogen chloride gas. 4,065,513, Cl. 260-656.00R.
Miller, Robert C.: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Robert C., 4,065,468, Cl. 260-346.750.
Miller, William H., Jr.; and Geary, Carl H., to Carrier Corporation. Shaft seal assembly for a rotary machine. 4,065,136, Cl. 277-3.000.
Milwaukee Faucets, Inc.: *See—*
Schmitt, William C., 4,064,900, Cl. 137-315.000.
Minami, Isao: *See—*
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; and Minami, Isao, 4,065,619, Cl. 544-25.000.
Minden, Henry T., to Sperry Rand Corporation. Laser optical coupler. 4,065,730, Cl. 331-94.50H.
Minnesota Mining & Manufacturing Company: *See—*
Paul, Fred R., Jr., 4,065,753, Cl. 340-152.00T.
Minolta Camera Kabushiki Kaisha: *See—*
Imaizumi, Masaru; and Inagaki, Syotaro, 4,065,120, Cl. 271-174.000.
Mirataev, Mirabdulla Mirakhmed ogly: *See—*
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Mirchev, Mircho Georgiev: *See—*
Sendov, Stoyan Hristov; Nikolov, Ivan Angelov; Kuklin, Ivan Alexandrov; and Mirchev, Mircho Georgiev, 4,065,393, Cl. 210-377.000.
Mirtain, Henri J., to Uniroyal. Raw pneumatic tire carcass and method of fabricating same. 4,065,338, Cl. 156-123.00R.
Mishiro, Shoji, to Taga Electric Co., Ltd. Supersonic vibrator with means for detecting vibrating speed. 4,065,687, Cl. 310-314.000.
Mitchell, Richard F.: *See—*
Palfreeman, John S.; Redwood, Martin; Smith, Frederick W.; and Mitchell, Richard F., 4,065,735, Cl. 333-72.000.
Mitsubishi Chemical Industries, Ltd.: *See—*
Yamawaki, Takeshi; Uchida, Takanori; and Nakajima, Makoto, 4,065,426, Cl. 260-33.6AQ.
Mitsubishi Denki Kabushiki Kaisha: *See—*
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Kondoh, Teruo; Ban, Kazuhiro; Kawamoto, Akio; Masuno, Yoshiki; and Yoshida, Mitsuhiro, 4,065,768, Cl. 343-9.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Yamanaka, Akira, 4,065,169, Cl. 296-35.00R.
Mitumori, Yoshio: *See—*
Shigemori, Youjiro; and Mitumori, Yoshio, 4,065,733, Cl. 331-112.000.
Miura, Genmei; and Takeshita, Kanou, to Canon Kabushiki Kaisha. Input device for processing system probe controlled. 4,065,754, Cl. 340-166.00R.
Miyabayashi, Noriyuki: *See—*
Kikuchi, Yosio; Miyabayashi, Noriyuki; and Wada, Masao, 4,065,275, Cl. 55-121.000.
Miyagawa, Takahito: *See—*
Uno, Keiichi; and Miyagawa, Takahito, 4,065,439, Cl. 260-75.00R.
Miyagishima, Tosh, to Hydril Company. Well line strap connection. 4,064,601, Cl. 24-16.0PB.
Miyake, Hajimu: *See—*
Hayashi, Masaki; Kori, Seiji; Miyake, Hajimu; and Okada, Takanori, 4,065,632, Cl. 560-55.000.
Miyoshi, Mituji; Matsuura, Kazuo; Kuroda, Nobuyuki; and Ogawa, Shiro, to Nippon Oil Company Limited. Process for the production of polyolefins. 4,065,611, Cl. 526-124.000.
Mizikar, David M.: *See—*
Schanzenbach, George P., Jr.; and Mizikar, David M., 4,064,764, Cl. 74-2.000.
Mizoguchi, Toshiyuki: *See—*
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Mizokami, Nariakira: *See—*
Horii, Satoshi; Kameda, Yukihiko; and Mizokami, Nariakira, 4,065,615, Cl. 536-10.000.
Mizukawa, Takumi; Nakamura, Masatatsu; Funakoshi, Kouzi; and Kominami, Hideyuki, to Matsushita Electric Industrial Co., Ltd. Inverter circuit for induction heating cooking ovens with a protection device. 4,065,802, Cl. 361-18.000.
Moberg, Carl Ake: *See—*
Bratt, Sven Ake; and Moberg, Carl Ake, 4,064,948, Cl. 173-12.000.
Moffitt, John Stuart: *See—*
Arrasmith, Fred Victor; Bruns, Donald George; Moffitt, John Stuart; and Moss, Stanton Kline, 4,065,123, Cl. 271-215.000.
Moggi, Pietro Antonio; and Iori, Giuseppe, to ANIC, S.p.A. Process for the synthesis of dibenzofuran. 4,065,469, Cl. 260-346.710.
Mohaupt, Henry H., to Kine-Tech Corporation. Oil well stimulation apparatus. 4,064,935, Cl. 166-63.000.
Molineux, Peter: *See—*
King, Robert David; Hiscutt, Robert; and Molineux, Peter, 4,065,600, Cl. 428-432.000.
Molins Machine Company, Inc.: *See—*
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Molnlycke AB: *See—*
Aberg, Sven Ulrik Torbjorn; and Bergdahl, Sven Gunnar, 4,065,347, Cl. 162-26.000.
Monsanto Company: *See—*
Campbell, Robert H.; and Wise, Raleigh W., 4,065,443, Cl. 260-79.50B.
Deets, Gary L., 4,065,428, Cl. 260-45.75B.
Osborne, Franklin T., 4,065,399, Cl. 252-182.000.
Montgomery Elevator Company: *See—*
Seaholm, Reuel A., 4,064,667, Cl. 52-204.000.
Montgomery, William H., to Aqua Plex Products. Self-contained aquarium system. 4,064,837, Cl. 119-5.000.
Monticelli, Dennis M., to National Semiconductor Corporation. Photodiode operational amplifier. 4,065,668, Cl. 250-214.00P.
Moon, Malcolm W.; and Sharp, John C., to Upjohn Company, The.

New method for controlling fungi using 4-chromone, 4-chromanone, 4-chromone oxime and 4-chromanone oxime compounds. 4,065,574, Cl. 424-283.000.

Moore, Alan Raymond, to Lucas Industries Limited. Multiphase full-wave rectifier assembly. 4,065,686, Cl. 310-68.00D.

Moore, Donald G., to Chemetron Corporation. Microwave oven adjusting (energy distribution) and tuning arrangement. 4,065,654, Cl. 219-10.55F.

Moore, John R., to International Telephone and Telegraph Corporation. Method of making conductive elastomer connectors. 4,064,623, Cl. 29-629.000.

Morey, Booker W., to Occidental Petroleum Corporation. Method of recovery of glass from municipal waste. 4,065,282, Cl. 65-28.000.

Morgan, David W.: *See—*
Brown, John T.; and Morgan, David W., 4,065,656, Cl. 219-121.0LM.

Morgan, Robert H., to Marsek, Richard V., a part interest. Security lock for dead-bolt door locks. 4,064,721, Cl. 70-416.000.

Mori, Hideo: *See—*
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Mori, Kunihito: *See—*
Torigoe, Masao; Mori, Kunihito; Tsuchiya, Mitsuru; and Takemura, Seiji, 4,065,233, Cl. 417-368.000.

Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; and Minami, Isao, to Takeda Chemical Industries, Ltd. 7-(α-Sulfoacylamido)cephalosporins. 4,065,619, Cl. 544-25.000.

Moroz, Jury Antonovich: *See—*
Grigorenko, Anatoly Sergeevich; Kravchenko, Vasily Savelievich; Moroz, Jury Antonovich; Kortusov, Leonid Ivanovich; and Vimba, Vladimir Ivanovich, 4,064,733, Cl. 72-453.030.

Morris, Gilbert; and Heinrich, Richard P., to Teledyne Electro Mechanisms. Method of making a flexible jumper strip. 4,064,622, Cl. 29-625.000.

Morris, Leeson R.: *See—*
Horning, Donald E.; Morris, Leeson R.; and Douglas, James L., 4,065,622, Cl. 544-105.000.

Morsell, Arthur Lee, to Xonics, Inc. Spherical electrode X-ray imaging chamber. 4,065,670, Cl. 250-315.00A.

Moscowitz, George S.; Rosen, John F.; and Hiatt, Sarah. Surgical table with anesthetic dispensing means. 4,064,877, Cl. 128-188.000.

Moser, John F., Jr.; and Behrmann, William C., to Exxon Research and Engineering Company. Combination isomerization-alkylation process. 4,065,516, Cl. 260-683.470.

Moss, Charles W. Shelter and method of making same. 4,064,663, Cl. 52-80.000.

Moss, Stanton Kline: *See—*
Arrasmith, Fred Victor; Bruns, Donald George; Moffitt, John Stuart; and Moss, Stanton Kline, 4,065,123, Cl. 271-215.000.

Motley, Ethelyn P.: *See—*
Hill, David A.; Pearson, Durk J.; Motley, Ethelyn P.; Beard, Thomas N.; and Farrell, James L., 4,065,183, Cl. 299-4.000.

Motorenfabrik Hatz GmbH & Co. KG: *See—*
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Motorola, Inc.: *See—*
Attwood, Stanley W., 4,065,718, Cl. 325-65.000.
Lillis, William Joseph; and Henry, Paul Mike, 4,065,725, Cl. 330-254.000.
London, Arnold, 4,065,736, Cl. 333-72.000.
Reese, Edmund Arthur; Meyer, Charles Shelley; and Leach, George S., Jr., 4,065,678, Cl. 307-237.000.

Moyer Diebel Limited: *See—*
Diebel, Howard, 4,064,888, Cl. 134-182.000.

Moyher, William G.: *See—*
Eckstein, George R.; and Moyher, William G., 4,065,541, Cl. 264-295.000.

Mukarovsky, Ladislav; Novak, Artur; and Kretschmer, Felix, to Ustredni statni veterinarni ustav. Automatic milking systems. 4,064,838, Cl. 119-14.080.

Mulcahy, Harry William, to AMSTED Industries Incorporated. Articulated railway car truck. 4,064,809, Cl. 105-167.000.

Mulchi, Charles L., to Wolf, Stanley I., a part interest. Air-pollution filter and face mask. 4,064,876, Cl. 128-146.600.

Muller, Albrecht; Haug, Theobald; and Renner, Alfred, to Ciba-Geigy Corporation. Process for the manufacture of polyaddition products containing imide groups. 4,065,433, Cl. 260-47.0UA.

Muller, Klaus: *See—*
Sauer, Friedrich; and Muller, Klaus, 4,065,378, Cl. 204-297.00W.

Muller, Westley C. Car retarder shoe structure. 4,064,976, Cl. 188-234.000.

Muller, Willy, to Ciba-Geigy AG. Tertiary alkyl substituted disazo pigments. 4,065,448, Cl. 260-176.000.

Multifold-International, Inc.: *See—*
Stapp, Willis J.; and Honnert, Quentin E., 4,064,675, Cl. 53-54.000.

Murakami, Nanami: *See—*
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Murakami, Norio, to Showa Koji K.K. Noise barrier. 4,064,960, Cl. 181-210.000.

Murakami, Yoshio: *See—*
Ogawa, Kazuyuki; Hirose, Masahiko; Shibagaki, Masahiro; Murakami, Yoshio; and Horiike, Yasuhiro, 4,065,369, Cl. 204-164.000.

Murakami, Yuetsu: *See—*
Masumoto, Hakaru; and Murakami, Yuetsu, 4,065,330, Cl. 148-31.550.

Murphy Chemical Limited: *See—*
Judd, David John, 4,065,289, Cl. 71-82.000.

Murphy, Frank W., Jr.; and Sparks, Buddy G., to Frank W. Murphy Manufacturer, Inc., a part interest. Remote multiple tank liquid level measuring device. 4,064,752, Cl. 73-302.000.

Murray, Joseph P.: *See—*
Garczynski, John S.; Jablanofsky, Charles C.; and Murray, Joseph P., 4,065,662, Cl. 235-419.000.

Murray, Julian W. Method of and means for forming floral puffs. 4,064,610, Cl. 29-243.500.

Murton, Gary. Pharmaceutical tablet and capsule counter. 4,065,000, Cl. 214-1.00C.

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Pfliegel, Todor; Seres, Jeno; Gajary, Antal; Daroczy nee Csuka, Klara; and Nagy, Lajos T., 4,065,491, Cl. 260-502.500.

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Nakajima, Makoto: *See—*
Yamawaki, Takeshi; Uchida, Takanori; and Nakajima, Makoto, 4,065,426, Cl. 260-33.6AQ.

Nakamura, Kimikazu: *See—*
Kubota, Katsuyuki; Fujii, Noboru; Yamada, Kouichi; Nakamura, Kimikazu; and Yuuki, Norihito, 4,064,616, Cl. 29-429.000.

Nakamura, Kimio: *See—*
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Nakamura, Tsutomu: *See—*
Sasaki, Takehiko; and Nakamura, Tsutomu, 4,064,688, Cl. 53-50.00R.

Nakano, Isamu: *See—*
Kobayashi, Mikio; and Nakano, Isamu, 4,065,342, Cl. 156-203.000.

Nakao, Masaru: *See—*
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Nakao, Shinroku, to Combi Co., Ltd. Leg assembly for a baby's go-cart. 4,065,086, Cl. 248-188.600.

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Inoue, Toshitugu; Nakamura, Takuji; Onoda, Tadayuki; and Nakatugawa, Tatuo, 4,065,792, Cl. 358-286.000.

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Owaki, Kenichi; Ando, Shizuo; and Nakayama, Norihiko, 4,065,698, Cl. 313-489.000.

Nakesch, Johann: *See—*
Fastner, Thorwald; Niedermayr, Alois; Nakesch, Johann; and Turmer, Max, 4,064,925, Cl. 164-66.000.

Narayanan, Venkatachala L.; Gadebusch, Hans H.; and Haugwitz, Rudiger D., to E. R. Squibb & Sons, Inc. 3-Hetero-5-isothiocyanophenyl oxadiazoles as antifungal and antibacterial agents. 4,065,563, Cl. 424-272.000.

Nash, Dudley O., to General Electric Company. Cooling of fastener means for a removable flameholder. 4,064,691, Cl. 60-39.060.

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Straitz, John F., III; and Mendoza, Vicente A., 4,065,248, Cl. 431-202.000.

National Gypsum Company: *See*—
Lawlis, John L.; Rodgers, Bernard L.; and Winkowski, Daniel A., 4,065,333, Cl. 156-40.000.
National Recreation Industries, Inc.: *See*—
Weinstein, Burton A.; and Lipe, Gordon C., 4,065,151, Cl. 280-618.000.
National Semiconductor Corporation: *See*—
Monticelli, Dennis M., 4,065,668, Cl. 250-214.00P.
National Steel Corporation: *See*—
Chadwick, Ronald M.; and Shearlock, David A., 4,065,004, Cl. 214-36.000.
National Union Electric Corporation: *See*—
Zauner, John H., 4,065,605, Cl. 429-112.000.
Zellhoefer, Glenn F., 4,065,604, Cl. 429-103.000.
Naumann, Alfred W.: *See*—
Hamling, Bernard H.; and Naumann, Alfred W., 4,065,544, Cl. 423-252.000.
Neiman, Michel, to Societe de Diffusion NEIMAN. Anti-theft cap for a screwthreaded base. 4,064,717, Cl. 70-165.000.
Nelson, Denny B., to Sunkist Growers, Inc. Intermediate amide pectins. 4,065,614, Cl. 536-2.000.
Nelson, John W., to Oliver Machinery Company. Heater for billets. 4,065,249, Cl. 432-8.000.
Nelson, Merritt J., to Zin-Plas Corporation. Adjustable faucet handle assembly. 4,065,216, Cl. 403-4.000.
Nelson, Paul Eugene: *See*—
Cramer, Clark Evans; Gaetjen, John Richard; Grant, Carl Henry; Nelson, Paul Eugene; and Newlin, Frank Allen, III, 4,065,810, Cl. 364-200.000.
Nelson, Stanford C. Disposable cutting insert and tool holder therefor. 4,065,223, Cl. 407-114.000.
Nemes, Miklos: *See*—
Rakoczi, Jozsef; Beck, Ivan; Kiss, Csaba; Horvath, Imre; and Nemes, Miklos, 4,065,450, Cl. 260-239.00B.
Netzbandt, William: *See*—
Miles, John J., Jr.; and Netzbandt, William, 4,065,564, Cl. 424-66.000.
Neuenschwander, Rudolf, to Scott Paper Company. Fiberizing method and apparatus employing differential feed system. 4,064,599, Cl. 19-96.000.
Neuhof, Jacob; and Scott, Robert D., to General Signal Corporation. Programmable electronic siren. 4,065,767, Cl. 340-384.00E.
New Nippon Electric Co., Ltd.: *See*—
Asami, Hiroshi; and Kaji, Masao, 4,065,374, Cl. 204-228.000.
Sakamoto, Yoshimasa; Iwanari, Sadayoshi; and Umene, Osamu, 4,065,741, Cl. 337-407.000.
Neward, Theodore C. Slide valve apparatus. 4,064,909, Cl. 137-625.480.
Newell, Harold R., to Mesur-Matic Electronics Corporation. Interpolating step motor system with reduction drive interface. 4,065,685, Cl. 310-49.00R.
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Newton, Alan Frank Roy, to Parel Societe Anonyme. Apparatus for providing flow of electrolyte through electrolytic cells. 4,065,375, Cl. 204-237.000.
Newton, Charles L.; and Gaumer, Lee S., to Air Products and Chemicals, Inc. Process for manufacturing liquefied methane. 4,065,278, Cl. 62-26.000.
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Tanaka, Hiroshi; and Yamamoto, Yoshihiro, 4,065,301, Cl. 75-203.000.
Nichimen Co., Ltd.: *See*—
Hayashi, Teishichi, 4,064,709, Cl. 66-135.000.
Nichols, Richard D. E.: *See*—
Bianchi, John E.; and Nichols, Richard D. E., 4,065,039, Cl. 224-2.00B.
Nicoud, Jean-Claude, to Societe de Vente de l'Aluminium Pechiney. Electrical conductors of aluminum-based alloys and process for the manufacture thereof. 4,065,326, Cl. 148-2.000.
Nidle, Charles: *See*—
German, Dale F.; and Nidle, Charles, 4,064,923, Cl. 152-427.000.
Niedermayr, Alois: *See*—
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Nihon Kagaku Kizai Kabushiki Kaisha: *See*—
Yoshiyuki, Honma; and Fumio, Yamazaki, 4,065,234, Cl. 417-420.000.
Nijhuis, Jan, to Hollandse Signaalapparaten B.V. False twisting unit. 4,064,684, Cl. 57-35.000.
Nikolov, Ivan Angelov: *See*—
Sendov, Stoyan Hristov; Nikolov, Ivan Angelov; Kuklin, Ivan Alexandrov; and Mirchev, Mircho Georgiev, 4,065,393, Cl. 210-377.000.
Nilson, Billy N., to KeNova AB. Tube container. 4,065,033, Cl. 222-107.000.
Nilsson, Allan Elvir, to Stifab AB. Apparatus for maintaining constant mass flow. 4,064,905, Cl. 137-499.000.
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Masui, Akira; Yamada, Kenzo; Ninomiya, Akinori; Tachibana, Katsuhiko; and Kato, Yoshihiro, 4,065,298, Cl. 75-60.000.
Nippon Electric Glass Company, Ltd.: *See*—
Baak, Nils Tryggve E. A.; and Rapp, Charles F., 4,065,317, Cl. 106-52.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Uchiyama, Yasuji, 4,064,778, Cl. 84-1.250.
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Masui, Akira; Yamada, Kenzo; Ninomiya, Akinori; Tachibana, Katsuhiko; and Kato, Yoshihiro, 4,065,298, Cl. 75-60.000.
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Miyoshi, Mituji; Matsuura, Kazuo; Kuroda, Nobuyuki; and Ogawa, Shiro, 4,065,611, Cl. 526-124.000.
Nippon Shinyaku Co., Ltd.: *See*—
Ohata, Katsuya; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, 4,065,562, Cl. 424-267.000.
Nipponkai Heavy Industries Co., Ltd.: *See*—
Kikuchi, Yosio; Miyabayashi, Noriyuki; and Wada, Masao, 4,065,275, Cl. 55-121.000.
Nishimura, Kenichi: *See*—
Kawai, Shoji; Nishimura, Kenichi; and Fukuda, Mitsuo, 4,065,358, Cl. 195-127.000.
Nishino, Atsushi; Sonetaka, Kazunori; and Kimura, Kunio, to Matsushita Electric Industrial Co., Ltd. Catalyst for use in treating gas. 4,065,406, Cl. 252-443.000.
Nishiumi, Shiro; Hasegawa, Shoichi; Mizoguchi, Toshiyuki; and Furuta, Sachiko, to Toray Industries, Inc. Spherical object useful as filler material. 4,065,599, Cl. 428-402.000.
Nissan Chemical Industries Ltd.: *See*—
Okada, Naotake; and Iwabuchi, Takeshi, 4,065,517, Cl. 260-823.000.
Nissan Motor Co., Ltd.: *See*—
Abe, Fumiyuki; Ikawa, Kazuo; Ehama, Mituo; and Ogawa, Naoki, 4,065,157, Cl. 280-751.000.
Kinoshita, Keijiro, 4,064,958, Cl. 180-66.00A.
Matsumoto, Junichiro; Iizuka, Haruhiko; and Kato, Fumiaki, 4,064,844, Cl. 123-32.0EA.
Nagasawa, Takashi, 4,064,849, Cl. 123-75.00B.
Nakagawa, Yasuhiko; Sasaki, Masahiro; Ito, Teruyuki; and Matuoka, Tosimitu, 4,064,850, Cl. 123-75.00B.
Yokohama, Masao; and Sakai, Shoji, 4,065,174, Cl. 297-66.000.
Nixdorf Computer AG: *See*—
Pollmeier, Werner, 4,065,713, Cl. 363-19.000.
Noble, Lowell; and Gaspar, James T., to United States of America, Army. Method of ion plating a thin metallic strip for flashlamp starting. 4,065,370, Cl. 204-192.00N.
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Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; and Minami, Isao, 4,065,619, Cl. 544-25.000.
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, to Matsushita Electric Industrial Co., Ltd. Multi-element magnetic head. 4,065,797, Cl. 360-113.000.
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Schliefer, Heinrich; and Warnecke, Friedrich Wilhelm, 4,065,250, Cl. 432-24.000.
Norden, John A. E. Seismic signal generating apparatus. 4,064,964, Cl. 181-114.000.
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Deisenroth, Norbert F.; Nordhaus, John P.; and Siegelman, Abe, 4,064,751, Cl. 73-207.000.
Norland Corporation: *See*—
Kristof, Paul J.; and Rose, Frederick A., 4,065,664, Cl. 364-487.000.
Northern Telecom Limited: *See*—
Davis, Dan Bryan, 4,064,634, Cl. 33-147.00L.
Northridge Trading Company: *See*—
Zusser, Louis H., 4,065,657, Cl. 219-225.000.
Norton, Henry James: *See*—
Gotchel, Joel Peter; Norton, Henry James; and Spengos, Aris C., 4,064,600, Cl. 19-156.300.
Nothdurft, Heinz: *See*—
Hofer, Gerald; Bofinger, Gunter; Nothdurft, Heinz; Khosrawi, Mohammad-Ali; Simon, Helmut; and Konrath, Karl, 4,065,236, Cl. 417-493.000.
Nott Company: *See*—
Mahle, Howard C.; and Thomas, Harris B., 4,065,005, Cl. 214-41.00R.
Nouchi, Norimoto: *See*—
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, 4,065,797, Cl. 360-113.000.
Nouvertne, Werner: *See*—
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Mukarovsky, Ladislav; Novak, Artur; and Kretschmer, Felix, 4,064,838, Cl. 119-14.080.
November, Milton H., to International Telephone and Telegraph Corporation. Vibration densitometer. 4,064,758, Cl. 73-32.00A.
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Nu-Dell Plastics Corporation: *See*—
Ulrich, John, 4,065,091, Cl. 248-473.000.
Nudelman, Abraham: *See*—
McCaully, Ronald J.; Nudelman, Abraham; and Bell, Stanley C., 4,065,451, Cl. 260-239.30D.
Nudenberg, Walter: *See*—
Delaney, Edward A.; Pinkowski, Norman J.; and Nudenberg, Walter, 4,065,444, Cl. 260-880.00R.
Nussbaum, Otto J., to Halstead Industries, Inc. Solar heat collector. 4,064,868, Cl. 126-271.000.

Nutro Patentverwertungs-und Maschinen-Handels GmbH: *See*—
Grocke, Diethelm, 4,064,678, Cl. 53-183.000.
N.V. Bekaert S.A.: *See*—
Buyssens, Noel; and Verbauwhede, Germain, 4,064,915, Cl. 139-425.00R.
Nyman, Curt Lennart. Apparatus for and method of inspecting tubular textile goods. 4,065,213, Cl. 356-200.000.
O.K. Machine and Tool Corporation: *See*—
Kober, Marvin, 4,064,581, Cl. 7-14.10R.
Oaks, Daniel V., to MacLean-Fogg Lock Nut Company. Die assembly and method for clinching fasteners to panels. 4,064,617, Cl. 29-432.100.
O'Brien, Rory Morgan, to Alfred Herbert Limited. Apparatus for displaying a band representation of a signal. 4,065,716, Cl. 324-96.000.
Occidental Petroleum Corporation: *See*—
Morey, Booker W., 4,065,282, Cl. 65-28.000.
Oda, Eisuke: *See*—
Shii, Hikaru; and Oda, Eisuke, 4,065,594, Cl. 428-113.000.
Oda, Yoshio; Suhara, Manabu; and Endo, Eiji, to Asahi Glass Co., Ltd. Process for producing alkali metal hydroxide. 4,065,366, Cl. 204-98.000.
Ogawa, Kazuyuki; Hirose, Masahiko; Shibagaki, Masahiro; Murakami, Yoshio; and Horiike, Yasuhiro, to Tokyo Shibaura Electric Co., Ltd. Activated gas reaction apparatus & method. 4,065,369, Cl. 204-164.000.
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Ogden, Ralph. Torch cutting machine and drive control arrangement therefor. 4,065,109, Cl. 266-69.000.
Oh, John H.: *See*—
Oita, Katashi; San Clemente, Marion R.; Oh, John H.; and Tiedeman, George T., 4,065,576, Cl. 424-318.000.
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Ohashi, Katsuji. Rotary speed minute regulating device for output shaft in puller apparatus. 4,065,043, Cl. 226-141.000.
Ohata, Katsuya; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, to Nippon Shinyaku Co., Ltd. Method and composition for reducing blood glucose levels. 4,065,562, Cl. 424-267.000.
Ohguchi, Masakatsu: *See*—
Igeta, Kikuji; and Ohguchi, Masakatsu, 4,065,256, Cl. 8-115.500.
Ohkawara Mfg., Co., Ltd.: *See*—
Okawara, Kahei, 4,064,831, Cl. 118-303.000.
Ohnaka, Makoto, to Shiroyama Kogyo Co., Ltd. Manipulator. 4,065,001, Cl. 214-1.0BV.
Ohno, Masaji: *See*—
Hosoi, Kazuo; Kawabe, Norio; and Ohno, Masaji, 4,065,475, Cl. 260-348.310.
Ohtani, Kiyoshi; and Takamiya, Kikuzo, to Bridgestone Cycle Co. Ltd. Caliper brake for bicycles for maintaining equal distance between both brake shoes and a wheel therebetween. 4,064,972, Cl. 188-24.000.
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Okada, Takanori: *See*—
Hayashi, Masaki; Kori, Seiji; Miyake, Hajimu; and Okada, Takanori, 4,065,632, Cl. 560-55.000.
Okami, Eiryo, to Yoshida Kogyo K.K. Method of producing precast concrete panels with built-in outer sash frames. 4,065,540, Cl. 264-278.000.
Okawara, Kahei, to Ohkawara Mfg., Co., Ltd. Device for coating granular solids. 4,064,831, Cl. 118-303.000.
Okazaki, Takashi: *See*—
Sasaki, Kantaro; Ikeda, Takami; Matsuo, Tohru; and Okazaki, Takashi, 4,065,297, Cl. 75-52.000.
Okigami, Noboru; Sekiguchi, Yoshitoshi; Ito, Takusen; and Onose, Kenji, to Hitachi Shipbuilding and Engineering Co., Ltd. Apparatus for incinerating waste gases. 4,065,247, Cl. 431-202.000.
Old, John L., to Massey-Ferguson Services N.V. Material handling apparatus. 4,065,009, Cl. 214-131.00A.
Oldham, George Ronald, to Johnson & Johnson. Dental floss threader with locking means. 4,064,883, Cl. 132-93.000.
Olevsky, Viktor Markovich: *See*—
Evkin, Ivan Frolovich; Petrov, Vladimir Alexandrovich; Olevsky, Viktor Markovich; Ruchinsky, Vitaly Rafael-Abovich; Bushev, Vladimir Semenovich; and Tatyanchikov, Valentin Alexeevich, 4,065,346, Cl. 159-6.00R.
Oliveira, Joseph P., II. Touch-Tone encoder unit for mobile radio transmitter. 4,065,755, Cl. 340-171.0PF.
Oliver Machinery Company: *See*—
Nelson, John W., 4,065,249, Cl. 432-8.000.
Oliver Technik AG: *See*—
Rouiller, Jean Marie, 4,065,640, Cl. 179-7.1TP.
Olmsted, Bernie A., to Package Machinery Company. Non-return valve for mottle charge in plastic injection molding machine. 4,065,108, Cl. 366-76.000.
Olschewski, Armin: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; Burkl, Erich; and Kiener, Heinz, 4,065,193, Cl. 308-233.000.
Olsen, Robert Charles, to Illinois Tool Works Inc. Shipping carton construction. 4,064,989, Cl. 206-428.000.
Olson, Harold G., to H. G. Olson & Co., Inc. Sealed closures with weather stripping. 4,064,654, Cl. 49-489.000.
Olson, Jerome B.: *See*—
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Onder, Besir K.: *See*—
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Ondrasik, Vladimir J., II. Deflection-resistant rack. 4,064,994, Cl. 211-153.000.
O'Neill, Daniel R.: *See*—
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Sasajima, Kikuo; Ono, Keiichi; Nakao, Masaru; Maruyama, Isamu; Katayama, Shigenari; Inaba, Shigeho; and Yamamoto, Hisao, 4,065,565, Cl. 424-250.000.
Ono Pharmaceutical Company: *See*—
Hayashi, Masaki; Kori, Seiji; Miyake, Hajimu; and Okada, Takanori, 4,065,632, Cl. 560-55.000.
Onoda, Tadayuki: *See*—
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Takeno, Shouzo; Mashita, Masao; and Onodera, Toshihiro, 4,065,734, Cl. 333-30.00R.
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Oota, Shingo, to Kabushiki Kaisha Komatsu Seisakusho. Engine mounting apparatus. 4,065,082, Cl. 248-9.000.
Opcon, Inc.: *See*—
Wicklund, Joseph B., Jr., 4,065,724, Cl. 330-252.000.
Oppolzer, Wolfgang, to CHON Corporation. Trans-N-acyl-N-alkyl-1-amino-1,3-butadienes, trans-N-acyl-N-aryl-1-amino-1,3-butadienes and preparation thereof. 4,065,496, Cl. 260-561.00R.
Optilon W. Erich Heilmann GmbH: *See*—
Heimberger, Helmut, 4,064,602, Cl. 24-205.10C.
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Cunningham, James Thomas; Snow, Frederick Orren, III; April, Joseph Richard; and Yu, A. Tobey, 4,065,002, Cl. 214-14.000.
Orlowski, Gerald J., to Armour and Company. Molding apparatus and method. 4,065,241, Cl. 425-228.000.
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de Nora, Vittorio, 4,065,367, Cl. 204-98.000.
Orthman, Henry K., to Orthman Manufacturing, Inc. Forklift attachment for moving three-point mounted equipment. 4,065,013, Cl. 214-620.000.
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Orthman, Henry K., 4,065,013, Cl. 214-620.000.
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Siddall, Keith, 4,065,224, Cl. 408-230.000.
Osborne, Anthony Walter, to Intechsa, S.A. Glass painting method. 4,065,311, Cl. 96-27.00R.
Osborne, Franklin T., to Monsanto Company. Process for controlling a bonding gas system. 4,065,399, Cl. 252-182.000.
Osman, Kenneth L.: *See*—
Andre, Michael G.; Schmidt, Melvin J.; and Osman, Kenneth L., 4,065,199, Cl. 339-17.00F.
Osterhout, Joseph C., to Westinghouse Electric Corporation. Spark gap assembly for voltage surge arresters. 4,065,692, Cl. 313-325.000.
Ostolski, Timothy D.: *See*—
Young, Richard E.; and Ostolski, Timothy D., 4,065,761, Cl. 340-271.000.
Ostrowski, Richard C., to Caterpillar Tractor Co. Standardized investment mold assembly. 4,064,927, Cl. 164-244.000.
Otani, Susumu: *See*—
Katoh, Takashi; and Otani, Susumu, 4,064,598, Cl. 19-105.000.
O'Toole, John M. Collapsible tetrahedral structure. 4,064,662, Cl. 52-71.000.
Otsuka, Katsumi, to Toplan Manufacturing Inc.; and Teibow Company Limited. Writing instrument. 4,065,215, Cl. 401-199.000.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Nakagawa, Kazuyuki; Murakami, Nanami; Mori, Hideo; and Tanimura, Kaoru, 4,065,456, Cl. 260-289.00R.
Outboard Marine Corporation: *See*—
Hall, Charles B.; and Young, Robert F., 4,064,824, Cl. 115-41.0HT.
McBride, Edward D., 4,064,765, Cl. 74-6.000.
Ouyang, Paul Hsiung. Self-aligned double implanted short channel V-groove MOS device. 4,065,783, Cl. 357-41.000.
Owaki, Kenichi; Ando, Shizuo; and Nakayama, Norihiko, to Fujitsu Limited. Gas discharge display device including plurality of discharge panel units with intermediate light absorbing plates. 4,065,698, Cl. 313-489.000.

Owen, David Peter; and Miles, Barry Donald Ruberry, to Quantel Limited. Time base corrector. 4,065,787, Cl. 358-160.000.

Owens-Corning Fiberglas Corporation: *See—*
Langlois, Roland E., 4,065,274, Cl. 55-89.000.
Wong, Robert; and Hill, Homer G., 4,065,417, Cl. 260-17.4CL.

Owens, David Vincent: *See—*
Roberts, Gregory Todhunter; Owens, David Vincent; and Goodspeed, Raymond Frank, 4,065,299, Cl. 75-67.00A.

Owens-Illinois, Inc.: *See—*
Lenard, William; and Taylor, Lynn J., 4,065,589, Cl. 428-35.000.
Steierman, Bernard L., 4,065,696, Cl. 313-480.000.
Steierman, Bernard L., 4,065,697, Cl. 313-480.000.

Oyama, George C.: *See—*
Warner, Donald E.; and Oyama, George C., 4,065,645, Cl. 179-156.00R.

Pabst, Rolf; and Lenz, Siegfried, to Daimler-Benz Aktiengesellschaft; and Suddeutsche Kuhlerfabrik Julius Fr. Behr. Equalization tank for cooling liquid. 4,064,848, Cl. 123-41.540.

Paccione, Sebastian W.; and Risnychok, Theodore J., to Sperry Rand Corporation. Printer device using time shared hammers. 4,064,800, Cl. 101-93.140.

Pacemaker Corporation: *See—*
Weitzman, Stewart, 4,064,628, Cl. 32-14.00B.

Package Machinery Company: *See—*
Olmsted, Bernie A., 4,065,108, Cl. 366-76.000.

Pacozzi, Pierino, to Siemens-Albis Aktiengesellschaft. Method for checking transmitter-receiver reversing switches in pulse-doppler radar devices. 4,065,769, Cl. 343-17.700.

Padmanathan, Thurairajah, to Bison-werke Bahre & Greten GmbH & Co. KG. Process for preparing highly pure 1-nitroanthraquinone. 4,065,477, Cl. 260-369.000.

Pahnke Engineering G.m.b.H. & Co. KG: *See—*
Pahnke, Hans J., 4,064,734, Cl. 72-455.000.

Pahnke, Hans J., to Pahnke Engineering G.m.b.H. & Co. KG. Hammer forging presses. 4,064,734, Cl. 72-455.000.

Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr. Capstan. 4,065,044, Cl. 226-188.000.

Pak-A-Matic, Inc.: *See—*
King, George; and Hannon, James V., 4,064,676, Cl. 53-77.000.

Palfreeman, John S.; Redwood, Martin; Smith, Frederick W.; and Mitchell, Richard F., to U.S. Philips Corporation. Electrical filters including coupled resonators. 4,065,735, Cl. 333-72.000.

Palmer, David A.: *See—*
Fields, Ellis K.; Zimmerschied, Wilford J.; and Palmer, David A., 4,065,442, Cl. 260-78.410.

Palmer, Jeffrey T.: *See—*
Bateman, Mark E.; and Palmer, Jeffrey T., 4,065,349, Cl. 162-158.000.

Palmer, Leonard, to Lened, Inc. Disc record manufacturing method and apparatus. 4,064,674, Cl. 53-23.000.

Palosi, Eva: *See—*
Lorincz, Csaba; Szasz, Kalman; Bolyos, Maria; Jovanovics, Karola; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,065,458, Cl. 260-293.550.

Pandey, Ramesh C.; and Rinehart, Kenneth L., Jr., to University of Illinois Foundation. Graft thin layer chromatography. 4,065,384, Cl. 210-31.00C.

Panigrahi, Godavarish, to Burroughs Corporation. Associative memory with neighboring recirculated paths offset by one bit. 4,065,756, Cl. 365-49.000.

Parcor: *See—*
Heymes, Alain; and Maffrand, Jean-Pierre, 4,065,460, Cl. 260-294.80C.
Heymes, Alan; and Maffrand, Jean-Pierre, 4,065,459, Cl. 260-294.80C.

Parel Societe Anonyme: *See—*
Newton, Alan Frank Roy, 4,065,375, Cl. 204-237.000.

Parham, Harold D. Three-wheel motorcycle. 4,064,957, Cl. 180-27.000.

Parker-Hannifin Corporation: *See—*
Adams, Ted, 4,065,094, Cl. 251-26.000.
Busdiecker, Wayne Scott; and Seymour, Harold Henry, 4,064,913, Cl. 138-125.000.
Rich, Beldon Lee; and Lansky, Zdenek J., 4,064,788, Cl. 91-395.000.

Pass, Sidney M. School crossing barricade. 4,065,104, Cl. 256-13.100.

Patten, Hudson Taylor; and Woodcock, Floyd Baylie, to Bunker Ramo Corporation. Acoustical underwater communication system for command control and data. 4,065,747, Cl. 340-5.00R.

Paul, Fred R., Jr., to Minnesota Mining & Manufacturing Company. Electromagnetically responsive projectile and system for detecting same. 4,065,753, Cl. 340-152.00T.

Pauli, Jude A., to Emerson Electric Co. Refrigerant liquid indicator. 4,064,826, Cl. 116-117.00C.

Paulus, Philippe; and Econompoulos, Mario, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Continuous heat treatment of cold rolled steel strip. 4,065,329, Cl. 148-18.000.

Pauty, Bernard, to Seb S.A. Domestic appliance for conditiong food such as salads. 4,065,811, Cl. 366-244.000.

Pavilanis, Vytautas: *See—*
Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Schrenk, Heinrich Maria, 4,065,570, Cl. 424-273.00R.
Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Schrenk, Heinrich Maria, 4,065,571, Cl. 424-273.00R.

Pavlov, Todor: *See—*
Johnson, George Michael; Krueger, Kenneth Keith; and Pavlov, Todor, 4,064,882, Cl. 128-351.000.

Paxson, Timm E.: *See—*
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,065,505, Cl. 260-600.00R.

Pearson, Durk J.: *See—*
Hill, David A.; Pearson, Durk J.; Motley, Ethelyn P.; Beard, Thomas N.; and Farrell, James L., 4,065,183, Cl. 299-4.000.

Pecherer, Benjamin: *See—*
Brossi, Arnold; Pecherer, Benjamin; and Sunbury, Robert, 4,065,473, Cl. 260-340.50R.

Pecoraro, George A., to PPG Industries, Inc. Seal for threshold cooler or holddown member of a float glass tank. 4,065,285, Cl. 65-182.00R.

Pels-Leusden, Carl Otto; Stupperich, Robert; Weber, Hans-Bernd; and Reinders, Rudi, to Institute fur Ziegelforschung Essen e.V. Installation for drying molded blanks. 4,064,639, Cl. 34-212.000.

Penningroth, Herbert M.; and Guyton, James H., to General Motors Corporation. Diagnostic connection means for vehicle mounted radio. 4,065,719, Cl. 325-312.000.

Pennington, Charles A. Guide for a motorized circular handsaw. 4,065,114, Cl. 269-2.000.

Pennwalt Corporation: *See—*
Sandler, Stanley Robert, 4,065,630, Cl. 560-26.000.

Perego, Giuseppe. Convertible chair. 4,065,175, Cl. 297-130.000.

Peripheral Dynamics, Inc.: *See—*
Garczynski, John S.; Jablanofsky, Charles C.; and Murray, Joseph P., 4,065,662, Cl. 235-419.000.

Perkins, David R. Compound vessel. 4,065,016, Cl. 215-6.000.

Peroni, Peter A.: *See—*
Teti, Joseph A., Jr.; and Peroni, Peter A., 4,064,594, Cl. 16-125.000.

Perry, Thomas W.: *See—*
Carella, Richard F.; and Perry, Thomas W., 4,065,178, Cl. 297-341.000.

Petersen, Virgil F.; and Skirvin, Willard L., to Cincinnati Electronics Corporation. Purge and charge equipment. 4,064,898, Cl. 137-240.000.

Peterson, Albert Henry, to Hercules Incorporated. Solar energy absorber. 4,065,593, Cl. 428-92.000.

Peterson, Donald John; and Robbins, Medford Dwight, to Procter & Gamble Company, The. Process for preparing substituted cyclopropycarbinyl compounds. 4,065,480, Cl. 260-429.900.

Peterson, Donald W.: *See—*
Cvetko, Henry J.; and Peterson, Donald W., 4,065,648, Cl. 179-178.000.

Peterson, Robert F., Jr.: *See—*
Farber, Milton; Loveless, Frederick C.; and Peterson, Robert F., Jr., 4,064,922, Cl. 152-347.000.

Peterson, Wesley Robinson: *See—*
Jaffe, Wolfgang; and Peterson, Wesley Robinson, 4,065,739, Cl. 335-234.000.

Petillo, Phillip J. Fret. 4,064,779, Cl. 84-314.000.

Petit, William A.: *See—*
Huffman, Jerry P.; LaForest, John P.; Petit, William A.; and Smith, James A., 4,065,081, Cl. 246-34.00R.

Petro-Tex Chemical Corporation: *See—*
Cares, William R., 4,065,512, Cl. 260-641.000.

Petroff, Mitchell. Filter and air freshener apparatus. 4,065,262, Cl. 21-74.00R.

Petrolite Corporation: *See—*
Martin, Richard L.; and French, Eddie C., 4,065,373, Cl. 204-195.00C.
Quinlan, Patrick M., 4,065,260, Cl. 21-2.70R.

Petrone, Joseph A. Gas main stopper. 4,064,912, Cl. 138-94.000.

Petrov, Vladimir Alexandrovich: *See—*
Evkin, Ivan Frolovich; Petrov, Vladimir Alexandrovich; Olevsky, Viktor Markovich; Ruchinsky, Vitaly Rafael-Abovich; Bushev, Vladimir Semenovich; and Tatyanchikov, Valentin Alexeevich, 4,065,346, Cl. 159-6.00R.

Peviani, Camillo: *See—*
Connizzoli, Mario; Peviani, Camillo; and Maietti, Francesca, 4,064,707, Cl. 62-374.000.

Pfizer Inc.: *See—*
Kurowsky, Stephen R., 4,065,607, Cl. 526-15.000.
Schaaf, Thomas K.; and Bindra, Jasjit Singh, 4,065,472, Cl. 260-332.20C.

Pfliegel, Todor; Seres, Jeno; Gajary, Antal; Daroczy nee Csuka, Klara; and Nagy, Lajos T., to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Process for the preparation of N-phosphonomethyl-glycine. 4,065,491, Cl. 260-502.500.

Philadelphia Tramrail Company: *See—*
Schwab, A. Henry, 4,064,650, Cl. 49-277.000.

Philip Morris, Inc.: *See—*
Gergely, Alex Sandor, 4,065,239, Cl. 425-141.000.

Phillips Petroleum: *See—*
Holtz, Hans D., 4,065,511, Cl. 260-635.00R.

Phillips Petroleum Company: *See—*
Cole, Clinie E., 4,065,240, Cl. 425-222.000.

Phillips, Thomas E., to Baxter Travenol Laboratories, Inc. Flow control device. 4,065,093, Cl. 251-6.000.

Phipps, Frank T., to Timerax Holdings Ltd. Pool liner retainer. 4,064,571, Cl. 4-172.190.

Photocircuits Division of Kollmorgen Corporation: *See—*
Herrmann, Gunther, 4,065,363, Cl. 204-1.00T.

Piche, Ernest. Tenon cutting machine with cutting head. 4,064,920, Cl. 144-200.000.

Picker Corporation: *See—*
Pleil, Viktor W., 4,065,689, Cl. 313-56.000.

Pierik, Gerald A.: *See*—
House, William H.; and Pierik, Gerald A., 4,064,981, Cl. 192-141.000.
Pilarski, Regis V.; and Yates, Gerald A., to Firestone Tire & Rubber Company, The. Dual spool retractor. 4,065,070, Cl. 242-107.40A.
Pilz, William M., III, to Container Corporation of America. Self-locking flanged cap. 4,065,048, Cl. 229-43.000.
Pines Trailer Corporation: *See*—
Gregg, Richard G., 4,065,168, Cl. 296-28.00M.
Pinkowski, Norman J.: *See*—
Delaney, Edward A.; Pinkowski, Norman J.; and Nudenberg, Walter, 4,065,444, Cl. 260-880.00R.
Pinto, Alwyn, to Imperial Chemical Industries Limited. Methanol. 4,065,483, Cl. 260-449.500.
Pitney-Bowes, Inc.: *See*—
Gluck, Julius; and Vijayendran, Bheema Rao, 4,064,833, Cl. 118-646.000.
Pitt, Gillies D., to International Standard Electric Corporation. Discharge system for ballast tank or the like. 4,064,893, Cl. 137-115.000.
Pittaro, Richard J., to Krautkramer-Branson, Incorporated. Ultrasonic inspection device. 4,064,742, Cl. 73-611.000.
Pittman, Robert W.; and Hermes, Chester E., to Texaco Inc. Method and system for determining formation porosity. 4,064,749, Cl. 73-152.000.
Pleil, Viktor W., to Picker Corporation. Dual filament X-ray tube. 4,065,689, Cl. 313-56.000.
Plunkett, William O.: *See*—
Williams, David R., 4,064,857, Cl. 123-141.000.
Poarch, Archie L. Method for extraction of copper products from copper bearing material. 4,065,300, Cl. 75-117.000.
Pobuta, Walter; and Dolgos, Charles, to Thomas & Betts Corporation. Strap tension sensing and cut off mechanism. 4,064,918, Cl. 140-123.600.
Pogonowski, Ivo C., to Texaco Inc. Methods and gun for anchoring piles and for temporarily interconnecting two cylinders underwater. 4,064,703, Cl. 61-53.680.
Pogue, Russell W., Jr., to General Motors Corporation. Electronic channel selector. 4,065,720, Cl. 325-464.000.
Pohl, Jorg: *See*—
Emig, Peter; Pohle, Hans; Scheffler, Gerhard; Brock, Norbert; Lenke, Hans-Dieter; and Pohl, Jorg, 4,065,501, Cl. 260-570.600.
Pohle, Hans: *See*—
Emig, Peter; Pohle, Hans; Scheffler, Gerhard; Brock, Norbert; Lenke, Hans-Dieter; and Pohl, Jorg, 4,065,501, Cl. 260-570.600.
Pokorny, Joseph E.; and Keller, Richard N. Self-leveling extendable table. 4,064,814, Cl. 108-64.000.
Polke, Hans-Joachim, to W. H. Kuester K.G. Preforming apparatus for wires in stranding machines. 4,064,685, Cl. 57-55.000.
Pollack, Maxwell Aaron, to Van Dyk Research Corporation. Process for manufacturing a xerographic toner cartridge. 4,065,335, Cl. 156-69.000.
Pollmeier, Werner, to Nixdorf Computer AG. Voltage stabilizer. 4,065,713, Cl. 363-19.000.
Polva Nederland B.V.: *See*—
Acda, Petrus Marinus; and Karreman, Jacob, 4,065,243, Cl. 425-393.000.
Pond, David M.; Wang, Richard H. S.; and Irick, Gether, Jr., to Eastman Kodak Company. Polychromophoric heterocyclic ultraviolet stabilizers and their use in organic compositions. 4,065,427, Cl. 260-45.8NT.
Popeil Brothers, Inc.: *See*—
Popeil, Samuel J.; and Ruiz, Lorenzo Anthony, 4,065,115, Cl. 269-16.000.
Popeil, Samuel J.; and Ruiz, Lorenzo Anthony, to Popeil Brothers, Inc. Foldable cutting board. 4,065,115, Cl. 269-16.000.
Poppel, Gunter: *See*—
Beck, Heinz; Gabriel, Gerhard; and Poppel, Gunter, 4,065,608, Cl. 526-49.000.
Porter, Harold Felton: *See*—
Thorpe, John Anton; and Porter, Harold Felton, 4,065,486, Cl. 260-465.300.
Porter, Ralph D.: *See*—
Leskovec, Edward V.; and Porter, Ralph D., 4,065,112, Cl. 267-34.000.
Potter, Richard C., to Shell Oil Company. Insecticidal compositions employing certain block copolymers. 4,065,555, Cl. 424-83.000.
Potts, Vinson S., to Crown Cork & Seal Company, Inc. Easy opening can end with push-in tabs. 4,065,025, Cl. 220-258.000.
Poujois, Robert: *See*—
Barbier, Daniel; Ittel, Jean-Michel; and Poujois, Robert, 4,065,758, Cl. 340-227.00R.
Powell, James E., to Shell Oil Company. Tetrahydro-2-(nitromethylene)-2H-1,3-thiazine insect control agents. 4,065,560, Cl. 424-246.000.
PPG Industries, Inc.: *See*—
Christenson, Roger M.; and Evjen, Clarence E., 4,065,415, Cl. 260-17.4SG.
Christenson, Roger M.; and Evjen, Clarence E., 4,065,416, Cl. 260-17.4SG.
Cormany, Charles L., 4,065,323, Cl. 134-10.000.
Franz, Helmut, 4,065,626, Cl. 428-629.000.
Kallenborn, John, 4,065,065, Cl. 242-18.00G.
Ladage, Lawrence; and Holste, Hilary E., 4,065,267, Cl. 23-263.000.
Mang, Raymond L.; and Carr, Thomas W., 4,065,284, Cl. 65-114.000.
Miller, Richard H., 4,065,513, Cl. 260-656.00R.
Pecoraro, George A., 4,065,285, Cl. 65-182.00R.
Prucnal, Paul J.; and DeMajistre, Robert, 4,065,624, Cl. 428-522.000.
Rechlicz, Thomas A.; and Maloney, Bernard A., 4,065,534, Cl. 264-91.000.
Sare, Edward J.; and Lavanish, Jerome M., 4,065,543, Cl. 423-240.000.
Tunison, Donald E., Jr., 4,065,548, Cl. 423-410.000.
Prats, Michael, to Shell Canada Limited; and Shell Explorer Limited. Aquifer-plugging steam soak for layered reservoir. 4,064,942, Cl. 166-303.000.
Pratt, Richard D.; Proffitt, Paul F.; and Webb, George, to General Electric Company. Intumescent fire retardant material. 4,065,394, Cl. 252-8.100.
Pray, Winston C., to Flexible Steel Lacing Company. Fastener driver tool. 4,065,045, Cl. 227-147.000.
Pressmaster Ltd.: *See*—
Wiener, Hans, 4,065,084, Cl. 248-117.100.
Price Pfister Brass Mfg. Co.: *See*—
Tolnai, Julius L., 4,064,904, Cl. 137-454.500.
Princeton Chemical Research, Inc.: *See*—
Miller, Richard; Reich, Murray H.; and Kuntz, Emma, 4,065,537, Cl. 264-143.000.
Pringle, William L., to United States Steel Corporation. Vehicle wheel suspension assembly. 4,065,153, Cl. 280-704.000.
Prinzbach, Horst: *See*—
Koenig, Horst; Prinzbach, Horst; and Schwesinger, Reinhard, 4,065,454, Cl. 260-250.00P.
Procter & Gamble Company, The: *See*—
Haller, Thomas L., 4,065,037, Cl. 222-153.000.
Lucas, Malcolm Bramel, 4,065,536, Cl. 264-98.000.
Peterson, Donald John; and Robbins, Medford Dwight, 4,065,480, Cl. 260-429.900.
Proffitt, Paul F.: *See*—
Pratt, Richard D.; Proffitt, Paul F.; and Webb, George, 4,065,394, Cl. 252-8.100.
Progar, Donald J.; Bell, Vernon L.; and St. Clair, Terry L., to United States of America, National Aeronautics and Space Administration. Polyimide adhesives. 4,065,345, Cl. 156-309.000.
Provendier, Jacques Henri, to Societe Anonyme de Telecommunications. High capacity time connection networks. 4,065,641, Cl. 179-15.0AT.
Prucnal, Paul J.; and DeMajistre, Robert, to PPG Industries, Inc. Radiation curable coating composition. 4,065,624, Cl. 428-522.000.
Pulak, Richard P., to UOP Inc. Spent catalyst regeneration apparatus. 4,065,269, Cl. 23-288.00B.
Pullman Incorporated: *See*—
Hutchison, John W., 4,064,591, Cl. 16-99.000.
Puls, Walter: *See*—
Frommer, Werner; Gericke, Horst; Keup, Uwe; Puls, Walter; Schmidt, Delt; and Wagner, Otto, 4,065,557, Cl. 424-181.000.
Puskas, William L.: *See*—
Dussault, Jean G. M.; Geckle, Robert A.; and Puskas, William L., 4,064,885, Cl. 134-58.00R.
Pyott-Boone Machinery, Corporation: *See*—
Teti, John J., 4,065,011, Cl. 214-146.00E.
Quain, Wilbur C.: *See*—
Carter, Everett M.; and Quain, Wilbur C., 4,065,649, Cl. 200-5.00A.
Quantel Limited: *See*—
Owen, David Peter; and Miles, Barry Donald Ruberry, 4,065,787, Cl. 358-160.000.
Quatrini, L. Rita: *See*—
MacInnis, Martin B.; and Quatrini, L. Rita, 4,065,413, Cl. 260-9.000.
Quehen, Andre; and Figueres, Roger, to Secim; and Societe de Vente de l'Aluminium Pechiney. Apparatus for varying the mold length of endless belt molds using interchangeable belts. 4,064,929, Cl. 164-433.000.
Quinlan, Patrick M., to Petrolite Corporation. Halogen derivatives of alkynoxymethyl amines as corrosion inhibitors. 4,065,260, Cl. 21-2.70R.
Rabe, Paul R., to General Motors Corporation. Solid state threshold detector with hysteresis. 4,065,721, Cl. 328-1.000.
Rabenbauer, Ludwig. Air conditioned pet bed. 4,064,835, Cl. 119-1.000.
Rackliffe, Richard J.; Goodfriend, Harvey J.; and Armstrong, Lee R., to United Technologies Corporation. Relative and sub-cyclic speed measurements for internal combustion engine diagnostics. 4,064,747, Cl. 73-116.000.
Radakovich, Louis. Fork and frame assembly. 4,065,015, Cl. 214-750.000.
Radiometer A/S: *See*—
Jeppesen, Borge; and Aas, Flemming, 4,064,609, Cl. 29-235.000.
Raffel, Reiner: *See*—
Althausen, Ferdinand; and Raffel, Reiner, 4,065,106, Cl. 366-76.000.
Rakoczi, Jozsef; Beck, Ivan; Kiss, Csaba; Horvath, Imre; and Nemes, Miklos, to Egyt Gyogyszervegyeszeti Gyar. Process for preparing 2-guanidinomethyl-perhydroazocine-sulfate. 4,065,450, Cl. 260-239.00B.
Ralston, John Pershing; Turpin, Warren Huntsman, deceased; and by Turpin, Lola, legal representative. Spacesaver tiltable storage unit. 4,064,992, Cl. 211-75.000.
Randall, Robert P.; and Torbett, Richard L., to Three Rivers Aluminum Company. Sliding window. 4,064,653, Cl. 49-458.000.
Rankin, Billy F., to Burton, Parsons and Company, Inc. Contact lens cleaning solution. 4,065,324, Cl. 134-30.000.

Rapp, Charles F.: *See—*
Baak, Nils Tryggve E. A.; and Rapp, Charles F., 4,065,317, Cl. 106-52.000.

Rappuoli, Bruno: *See—*
Cecere, Francesco; Galli, Giuliano; Della Penna, Gino; and Rappuoli, Bruno, 4,065,353, Cl. 195-2.000.

Rasmussen, Villum Benedikt Kann; and Kann-Rasmussen, Lars Erik, to V. Kann Rasmussen & Co. Window, particularly intended for installation in an inclined or flat roof. 4,064,649, Cl. 49-250.000.

Ratledge, Houston, to Carrier Corporation. Refuse collection vehicles. 4,065,008, Cl. 214-83.300.

Raulf, Erich: *See—*
Gemmeke, Wilfried; Werner, Heinrich; Echterhoff, Heinz; and Raulf, Erich, 4,065,296, Cl. 75-48.000.

Raymond Lee Organization, Inc., The: *See—*
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Chan, Peter, 4,065,125, Cl. 273-5.00R.
Fals, Henry J., 4,064,781, Cl. 84-322.000.

Raytheon Company: *See—*
Knight, Philip A., Jr., 4,064,866, Cl. 126-271.000.

RCA Corporation: *See—*
Arnold, Anthony Francis, 4,065,588, Cl. 427-89.000.
Beyers, Billy Wesley, Jr., 4,065,681, Cl. 307-246.000.
Crosby, Edward Lewis, Jr., 4,064,740, Cl. 73-38.000.
Ross, Daniel Louis; and Barton, Lucian Anthony, 4,065,306, Cl. 96-1.00R.
Stern, Herman Abraham; Sorkin, Howard; and Schindler, Henry Claude, 4,064,919, Cl. 141-7.000.
Stewart, Wilber Clarence, 4,065,786, Cl. 358-128.000.
Wu, Chin Tao, 4,065,666, Cl. 364-759.000.

Realex Corporation: *See—*
Magers, Wallace Farnholm; Hudson, Larry Lee; and Workman, James Phillip, 4,065,038, Cl. 222-321.000.

Reavis, Robert E.: *See—*
Williams, David R., 4,064,857, Cl. 123-141.000.

Rebold, Jerome I.: *See—*
Meshulam, Avram; and Rebold, Jerome I., 4,064,626, Cl. 30-287.000.

Rechlicz, Thomas A.; and Maloney, Bernard A., to PPG Industries, Inc. Method of providing a resin reinforced asbestos diaphragm. 4,065,534, Cl. 264-91.000.

Redwood, Martin: *See—*
Palfreeman, John S.; Redwood, Martin; Smith, Frederick W.; and Mitchell, Richard F., 4,065,735, Cl. 333-72.000.

Rees, Huw David: *See—*
Gray, Kenneth Walter; and Rees, Huw David, 4,065,782, Cl. 357-23.000.

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Wild, Hans; Jeckel, Guenter; Echte, Adolf; Zizlsperger, Johann; Reffert, Rudi Wilhelm; and Thielen, Gunter, 4,065,532, Cl. 264-68.000.

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Baudoin, Patrice, 4,064,694, Cl. 60-413.000.

Regis Belt Maintenance Corporation: *See—*
Larson, Robert L., 4,064,775, Cl. 83-4.000.

Rego: *See—*
Billington, Evans R.; and Batka, Robert J., 4,064,907, Cl. 137-614.200.

Reh, Lothar: *See—*
Weckesser, Ernst; Sparwald, Volker; Reh, Lothar; Bohm, Eberhard; and Graf, Rolf, 4,065,271, Cl. 55-2.000.

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Miller, Richard; Reich, Murray H.; and Kuntz, Emma, 4,065,537, Cl. 264-143.000.

Reichhold Chemicals, Inc.: *See—*
Allyn, Charles L.; Manlove, James C.; Chang, Gerald M.; and Burmark, Robert C., 4,065,421, Cl. 260-29.40R.

Reid, Hugh F.: *See—*
Lussiez, Guy W.; and Reid, Hugh F., 4,065,105, Cl. 366-348.000.

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Hauck, Frederic P.; and-Reid, Joyce, 4,065,485, Cl. 260-464.000.

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Warner, Richard F.; Billand, William; and Vincent, Riggi, 4,064,644, Cl. 40-152.000.

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Pels-Leusden, Carl Otto; Stupperich, Robert; Weber, Hans-Bernd; and Reinders, Rudi, 4,064,639, Cl. 34-212.000.

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Faid, Robert W.; and Reinhart, William F., 4,064,672, Cl. 52-726.000.

Rejai, Jamshid, to Molins Machine Company, Inc. Emergency brake for movable conveyor. 4,065,122, Cl. 271-201.000.

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Eckstein, George R.; and Moyher, William G., 4,065,541, Cl. 264-295.000.

Renison, Joseph Theo: *See—*
Graham, Peter Charles; and Renison, Joseph Theo, 4,064,785, Cl. 85-62.000.

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Muller, Albrecht; Haug, Theobald; and Renner, Alfred, 4,065,433, Cl. 260-47.0UA.

Reno, Woodrow James, to Becton, Dickinson and Company. Device for making precise incisions for bleeding time testing and the like. 4,064,871, Cl. 128-2.00G.

Renold Ajax Inc.: *See—*
Breads, Eugene H., 4,064,708, Cl. 64-1.00V.

Rentmeester, Kenneth R.; Jurcenko, John A.; and Welks, John D., to American Can Company. Container and method of forming. 4,065,023, Cl. 220-75.000.

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Kowel, Stephen T.; and Kornreich, Phillipp G., 4,065,791, Cl. 358-213.000.

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Byrne, Robert Edward, 4,065,281, Cl. 65-19.000.

Rexnord Inc.: *See—*
MacMaster, Edward, 4,065,161, Cl. 292-113.000.
Stumpe, Warren R., 4,065,343, Cl. 156-212.000.

Reynolds, Charles A., to SmithKline Instruments, Inc. Real-time ultrasonic imaging system. 4,064,741, Cl. 73-620.000.

Reynolds, Duane S.: *See—*
Johnson, Laurence E.; and Reynolds, Duane S., 4,065,102, Cl. 254-186.0HC.

Rhone-Poulenc Industries: *See—*
Leroy, Maurice; and Helgorsky, Jacques, 4,065,547, Cl. 423-321.00S.

Rice, George W.: *See—*
Waters, Kenneth H.; and Rice, George W., 4,065,749, Cl. 340-15.5MC.

Rich, Beldon Lee; and Lansky, Zdenek J., to Parker-Hannifin Corporation. Cushioning means for hydraulic cylinder. 4,064,788, Cl. 91-395.000.

Richardson Company, The: *See—*
Muzyczko, Thaddeus M.; and Jones, Thomas H., 4,065,314, Cl. 96-115.00R.

Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Lorincz, Csaba; Szasz, Kalman; Bolyos, Maria; Jovanovics, Karola; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,065,458, Cl. 260-293.550.

Ridenour, Michael R., to Evans Products Company. Dual action control mechanism. 4,065,052, Cl. 236-86.000.

Ridler, Keith Douglas; Gosling, Alexander Bennett; and Edge, Gordon Malcolm, to Strathearn Audio Limited. Linear bearing for parallel tracking arm. 4,065,188, Cl. 308-10.000.

Riegelman, Harry M.; and Madison, Vernon Edwin, to Rusco Industries, Inc. Retainer for sliding doors and the like. 4,064,592, Cl. 16-100.000.

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Lakerveld, Herman Gerard; and Rietdijk, Johan Adriaan, 4,065,674, Cl. 250-406.000.

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Rigby, Robert Alexander, to Algard Pty. Ltd. Algae growth control. 4,065,386, Cl. 210-60.000.

Rilsan Corporation: *See—*
Koch, Robert B., 4,065,519, Cl. 260-857.0TW.

Rinaldo, James D., to Caterpillar Tractor Co. Modular control linkage assembly for a hydrostatic transmission. 4,064,766, Cl. 74-473.00R.

Rinehart, Kenneth L., Jr.: *See—*
Pandey, Ramesh C.; and Rinehart, Kenneth L., Jr., 4,065,384, Cl. 210-31.00C.

Rinehart, Michael Kent: *See—*
Myers, Charles Louis; and Rinehart, Michael Kent, 4,065,522, Cl. 260-880.00R.

Risnychok, Theodore J.: *See—*
Paccione, Sebastian W.; and Risnychok, Theodore J., 4,064,800, Cl. 101-93.140.

Riwoplan Medizin-Technische Einrichtungs-Gesellschaft mbH: *See—*
Heckele, Helmut, 4,064,886, Cl. 134-95.000.

Rizaev, Ramiz Gasan Kuli ogly; Mekhtiev, Soltan Dzhafarovich; Magerramova, Zemfira Jusif kyzy; Sheinin, Viktor Efimovich; Miratаev, Mirabdulla Mirakhmed ogly; and Guseinov, Idris Aslan ogly. Process for producing benzonitrile. 4,065,487, Cl. 260-465.00C.

Robbins, Joe David: *See—*
Johnston, Herbert N.; Wray, Joseph A.; Robbins, Joe David; and Schrager, Morton, 4,065,304, Cl. 96-1.0LY.

Robbins, Medford Dwight: *See—*
Peterson, Donald John; and Robbins, Medford Dwight, 4,065,480, Cl. 260-429.900.

Robert Bosch GmbH: *See—*
Cub, Fritz, 4,065,341, Cl. 156-187.000.
Fehrenbach, Siegfried; and Feuerbacher, Alfred, 4,064,854, Cl. 123-139.0AW.
Hacker, Wolf-Dieter; Friese, Karl-Hermann; Steinke, Leo; and Weyl, Helmut, 4,065,372, Cl. 204-195.00S.

Hofer, Gerald; Bofinger, Gunter; Nothdurft, Heinz; Khosrawi, Mohammad-Ali; Simon, Helmut; and Konrath, Karl, 4,065,236, Cl. 417-493.000.
Holzbaur, Siegfried, 4,064,843, Cl. 123-32.0EJ.
Holzbaur, Siegfried; and Barth, Horst, 4,064,847, Cl. 123-32.0EJ.
Latsch, Reinhard; and Bianchi, Valerio, 4,064,846, Cl. 123-32.0EA.
Wessel, Wolf, 4,064,851, Cl. 123-119.00B.

Roberts, Gregory Todhunter; Owens, David Vincent; and Goodspeed, Raymond Frank, to Teledyne Industries, Inc. Magnesium reclamation process and apparatus. 4,065,299, Cl. 75-67.00A.

Roberts, John A.; and Roberts, Peter R., to Brunswick Corporation. Method of making passage structures. 4,065,046, Cl. 228-156.000.

Roberts, Peter R.: *See—*
Roberts, John A.; and Roberts, Peter R., 4,065,046, Cl. 228-156.000.

Roberts, William C., Jr.; and Edmonds, Stephen. Variable camber wing sail. 4,064,821, Cl. 114-103.000.

Robeson, Lloyd Mahlon: *See—*
Bailey, Frederick Eugene; von Dohlen, Werner Claus; Matzner, Markus; Young, Robert Hayward; and Robeson, Lloyd Mahlon, 4,065,520, Cl. 260-878.00B.

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Hewett, Alan R.; and Robilliard, Leonard T., 4,064,813, Cl. 108-60.000.

Robinson, Kermit Hamlin, to Harnessed Energies, Inc. Doppler speedometer. 4,065,745, Cl. 340-3.00D.

Roblin Industries, Inc.: *See—*
Sauer, Gale E., 4,064,671, Cl. 52-696.000.

Rocco, Jack O., to Clark Equipment Company. Low lift truck. 4,065,012, Cl. 214-510.000.

Roche, Michael F.; Faist, Suzan M.; Eberhart, James G.; and Ross, Laurids E., to United States of America, Energy Research and Development Administration. Wick-and-pool electrodes for electrochemical cell. 4,065,602, Cl. 429-72.000.

Rock, Frank C. Computing postal scale and method with taring capability. 4,064,954, Cl. 177-25.000.

Rocket of London Limited: *See—*
Meredith, Hayden Gwyn, 4,064,881, Cl. 128-325.000.

Rockwell-Rimoldi S.p.A.: *See—*
Marforio, Nerino, 4,064,818, Cl. 112-258.000.

Rodeman, Donald W.: *See—*
Endres, Thomas E.; and Rodeman, Donald W., 4,065,723, Cl. 330-302.000.

Rodemeyer, Donald James; and Hruby, John Eugene, to Metaframe Corporation. Aminated animal habitat. 4,064,839, Cl. 119-15.000.

Rodenberg, Herbert G.: *See—*
Foulks, Harold C., Jr.; Rodenberg, Herbert G.; and Mains, Harold E., 4,065,418, Cl. 260-23.0XA.

Rodgers, Bernard L.: *See—*
Lawlis, John L.; Rodgers, Bernard L.; and Winkowski, Daniel A., 4,065,333, Cl. 156-40.000.

Rodgers, Douglas Noss; and Roy, Prodyot, to General Electric Company. Electrochemical carbon meter. 4,065,371, Cl. 204-195.00R.

Roebke, Heide, to Schering Corporation. Use of 2-imidazolines as hypoglycemic agents. 4,065,569, Cl. 424-273.00R.

Roest, Jacob B.: *See—*
De Beukelaar, Jan W.; Van Zwet, Henry; and Roest, Jacob B., 4,065,610, Cl. 526-70.000.

Rogers, Lloyd W., Jr., to General Motors Corporation. Belt retractor with winding prevention mechanism. 4,065,155, Cl. 280-744.000.

Rogers, Pamela J.: *See—*
Hutton, Thomas W.; and Rogers, Pamela J., 4,065,523, Cl. 260-885.000.

Rogier, Edgar R.: *See—*
MacKay, Kenneth D.; and Rogier, Edgar R., 4,065,502, Cl. 260-590.00R.

Rohm, Gunter Horst. Drill chuck. 4,065,139, Cl. 279-62.000.

Rohm and Haas Company: *See—*
Hutton, Thomas W.; and Rogers, Pamela J., 4,065,523, Cl. 260-885.000.

Rohner, Joachim, to W. Schlafhorst & Co. Creel carriage. 4,065,073, Cl. 242-131.000.

Rohr Industries, Incorporated: *See—*
Tseo, Gudin, 4,064,961, Cl. 181-213.000.

Roland Corporation: *See—*
Akamatsu, Keiji, 4,064,777, Cl. 84-1.030.

Roll-Out Insulation Systems, Inc.: *See—*
Cary, Charles C., 4,064,648, Cl. 47-17.000.

Rolls-Royce Limited: *See—*
Brooks, Leslie John, 4,065,077, Cl. 244-54.000.

Romanzi, Louis, Jr., to Gateway Industries, Inc. Safety belt buckle. 4,064,603, Cl. 24-230.00A.

Rooney, Clarence Stanley: *See—*
Atkinson, Joseph George; Rooney, Clarence Stanley; Girard, Yves; and Engelhardt, Edward L., 4,065,572, Cl. 424-273.00R.

Rose, Frederick A.: *See—*
Kristof, Paul J.; and Rose, Frederick A., 4,065,664, Cl. 364-487.000.

Rose, Ronald N. Control circuit. 4,065,227, Cl. 417-45.000.

Rosen, John F.: *See—*
Moscowitz, George S.; Rosen, John F.; and Hiatt, Sarah, 4,064,877, Cl. 128-188.000.

Ross, Daniel Louis; and Barton, Lucian Anthony, to RCA Corporation. Electron beam recording media containing 4,4'-bis(3-diazo-3,4-dihydro-4-oxo-1-naphthalene-sulfonyloxy)benzil. 4,065,306, Cl. 96-1.00R.

Ross, John E. System for aligning trailer hitches. 4,065,147, Cl. 280-477.000.

Ross, Laurids E.: *See—*
Roche, Michael F.; Faist, Suzan M.; Eberhart, James G.; and Ross, Laurids E., 4,065,602, Cl. 429-72.000.

Ross-Petersen, Karl Jakob, to Aktieselskabet Grindstedvaerket. Amino containing pyridyloxy propanols. 4,065,461, Cl. 260-296.0AE.

Rossi, John P., to CBS Inc. Method and apparatus for PCM-encoding NTSC color television at sub-Nyquist rate. 4,065,784, Cl. 358-13.000.

Rostad, Rolf A. Electronic control system for motors and the like. 4,065,804, Cl. 361-96.000.

Roth, Bernard E., to Safe Track Manufacturing Limited. Anti-jackknife apparatus. 4,065,149, Cl. 280-432.000.

Roth, William B., to United States of America, Agriculture. Methanol treated activated sludge as an agricultural chemical carrier. 4,065,287, Cl. 71-13.000.

Rouiller, Jean Marie, to Stoppani S.A., Etablissements pour la mecanique de precision et l'electro-mecanique; and Oliver Technik AG. Apparatus for interconnecting a telephone line and a portable calculator. 4,065,640, Cl. 179-7.1TP.

Rovac Corporation, The: *See—*
Edwards, Thomas C.; and Ecker, Amir L., 4,064,705, Cl. 62-2.000.

Rowan, Daniel J. Conveyor system for handling non-rigid containers. 4,064,987, Cl. 198-604.000.

Roy, Prodyot: *See—*
Rodgers, Douglas Noss; and Roy, Prodyot, 4,065,371, Cl. 204-195.00R.

Ruark, Bruce J.; and Shaner, Richard L., to General Electric Company. Hinge arrangement for room air conditioner access door. 4,065,027, Cl. 220-343.000.

Rubenstein, Kenneth E.: *See—*
Ullman, Edwin F.; and Rubenstein, Kenneth E., 4,065,354, Cl. 195-63.000.

Ruchinsky, Vitaly Rafael-Abovich: *See—*
Evkin, Ivan Frolovich; Petrov, Vladimir Alexandrovich; Olevsky, Viktor Markovich; Ruchinsky, Vitaly Rafael-Abovich; Bushev, Vladimir Semenovich; and Tatyanchikov, Valentin Alexeevich, 4,065,346, Cl. 159-6.00R.

Rudd, Alan J.: *See—*
Ruud, Alan J.; and Lewin, Ian, 4,065,667, Cl. 362-217.000.

Rudolph, Paul, to Metallgesellschaft Aktiengesellschaft. Process for breaking emulsions in a tar-containing aqueous condensate. 4,065,273, Cl. 55-50.000.

Rueggeberg, Werner; and Wiker, Joseph J., to Armstrong Cork Company. Plasma-process vacuum seal. 4,065,137, Cl. 277-34.000.

Ruga, Wayne. Structural system connection. 4,065,220, Cl. 403-169.000.

Ruhrnschopf, Ernst-Peter; and Linke, Gerhard, to Siemens Aktiengesellschaft. Planigraphic X-ray apparatus for the preparation of tomographic images. 4,065,397, Cl. 250-445.00T.

Ruiz, Lorenzo Anthony: *See—*
Popeil, Samuel J.; and Ruiz, Lorenzo Anthony, 4,065,115, Cl. 269-16.000.

Rusco Industries, Inc.: *See—*
Riegelman, Harry M.; and Madison, Vernon Edwin, 4,064,592, Cl. 16-100.000.

Russell, Lewis K., to Signetics Corporation. Collector-up logic transmission gates. 4,065,680, Cl. 307-214.000.

Rutledge, Thomas F., to ICI Americas Inc. Method of preparing high molecular weight polyphenoxy ethers from alkyl phenols. 4,065,434, Cl. 260-47.0ET.

Ruud, Alan J.; and Lewin, Ian, to Goulet, Donald L.; and Rudd, Alan J. Indirect lighting fixture including improved reflector. 4,065,667, Cl. 362-217.000.

Ryan, Walter Samuel: *See—*
Jenkins, Oliver James; Ryan, Walter Samuel; and Suit, Leslie David, 4,064,810, Cl. 105-378.000.

Ryco Graphic Manufacturing, Inc.: *See—*
Switall, Thomas G., 4,064,801, Cl. 101-147.000.

Saari, Veikko Reynold. Crystal oscillator including a pair of push-pull complementary transistor amplifiers. 4,065,728, Cl. 331-75.000.

Saari, Walfred S.: *See—*
Denny, George H.; and Saari, Walfred S., 4,065,464, Cl. 260-326.150.

Sabol, Alexander P.: *See—*
Jenkins, Renaldo V.; and Sabol, Alexander P., 4,064,841, Cl. 123-8.470.

Safe Track Manufacturing Limited: *See—*
Roth, Bernard E., 4,065,149, Cl. 280-432.000.

Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Coibion, Jean, 4,065,603, Cl. 429-99.000.

Sagmiller, Darrell J. Slipsheet pallet tool and method. 4,065,014, Cl. 214-621.000.

Sague, John E., to Messinger Bearings, Inc. Race insert for bearing. 4,065,192, Cl. 308-215.000.

St. Clair, Terry L.: *See—*
Progar, Donald J.; Bell, Vernon L.; and St. Clair, Terry L., 4,065,345, Cl. 156-309.000.

Saint-Gobain Industries: *See—*
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St. John, Roy H.: *See—*
Vykukal, Hubert C.; Chambers, Alan B.; and St. John, Roy H., 4,064,642, Cl. 36-92.000.

Sajben, Johannes-Otto: *See—*
Lippert, Axel; Joisten, Siegfried; and Sajben, Johannes-Otto, 4,065,339, Cl. 156-149.000.

Sakaguchi, Shinji; Imai, Shinichi; Yamaguchi, Junn; and Tsuji, Nobuo, to Fuji Photo Film Co., Ltd. Water-soluble polymers and process for producing the same. 4,065,435, Cl. 260-47.0UP.

Sakai, Shoji: *See*—
Yokohama, Masao; and Sakai, Shoji, 4,065,174, Cl. 297-66.000.
Sakamoto, Yoshimasa; Iwanari, Sadayoshi; and Umene, Osamu, to New Nippon Electric Co., Ltd. Thermal fuse with a fusible temperature sensitive pellet. 4,065,741, Cl. 337-407.000.
Salem, Eli: *See*—
Flynn, George; and Salem, Eli, 4,065,388, Cl. 210-80.000.
Salensky, George Anthony, to Union Carbide Corporation. Ethylene copolymer glass bottle coating. 4,065,590, Cl. 428-35.
Salmi, Pekka; Strom, Rolf; and Hirvisaari, Eero. Hydraulic drilling machine. 4,064,950, Cl. 173-151.000.
Sameshima, Shigeru, to Japan Port Consultants, Ltd. Marine engineering structure with wide base using a truss. 4,064,700, Cl. 61-4.000.
Samid, Ilan: *See*—
Gover, Avraham; Samid, Ilan; and Lee, Chien-Ping, 4,065,729, Cl. 331-94.50H.
Sampson Corporation, The: *See*—
Burstein, Albert H.; and Koslin, Bertram L., 4,064,567, Cl. 3-1.910.
Samuel Moore and Company: *See*—
Horvath, Louis T., 4,064,614, Cl. 29-417.000.
San Clemente, Marion R.: *See*—
Oita, Katashi; San Clemente, Marion R.; Oh, John H.; and Tiedeman, George T., 4,065,576, Cl. 424-318.000.
Oita, Katashi; San Clemente, Marion R.; Oh, John H.; and Tiedeman, George T., 4,065,577, Cl. 424-333.000.
Sanders, Antonius Hermanus. Bed side railing. 4,064,575, Cl. 5-331.000.
Sandler, Stanley Robert, to Pennwalt Corporation. Polyoxyalkylene fluoroalkyltrimellitates. 4,065,630, Cl. 560-26.000.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,064,582, Cl. 8-149.300.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,064,713, Cl. 68-5.00E.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Pressure sealing method. 4,064,582, Cl. 8-149.300.
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Sandoz, Inc.: *See*—
Kathawala, Faizulla G., 4,065,503, Cl. 260-592.000.
Sandoz Ltd.: *See*—
Jotterand, Armand, 4,065,447, Cl. 260-163.000.
Sanford, Michael Elliot: *See*—
Detroit, William John; and Sanford, Michael Elliot, 4,065,318, Cl. 106-90.000.
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Grundei, Hans; and Thomas, Wolfram, 4,064,568, Cl. 3-1.911.
Sankyu Inc.: *See*—
Kubota, Katsuyuki; Fujii, Noboru; Yamada, Kouichi; Nakamura, Kimikazu; and Yuuki, Norihito, 4,064,616, Cl. 29-429.000.
Sanshin Dengu Manufacturing Co., Ltd.: *See*—
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Santa Fe International Corporation: *See*—
Cook, William B., Jr., 4,064,968, Cl. 182-13.000.
Sare, Edward J.; and Lavanish, Jerome M., to PPG Industries, Inc. Catalytic oxidation of C_2-C_4 halogenated hydrocarbons. 4,065,543, Cl. 423-240.000.
Sasajima, Kikuo; Ono, Keiichi; Nakao, Masaru; Maruyama, Isamu; Katayama, Shigenari; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Acylhydrazones and antipsychotic compositions thereof. 4,065,565, Cl. 424-250.000.
Sasaki, Kantaro; Ikeda, Takami; Matsuo, Tohru; and Okazaki, Takashi, to Sumitomo Metal Industries Limited. Process for dephosphorizing molten pig iron. 4,065,297, Cl. 75-52.000.
Sasaki, Masahiro: *See*—
Nakagawa, Yasuhiko; Sasaki, Masahiro; Ito, Teruyuki; and Matuoka, Tosimitu, 4,064,850, Cl. 123-75.00B.
Sasaki, Takehiko; and Nakamura, Tsutomu, to Sharp Kabushiki Kaisha. Touch sensitive electrode assembly for solid state wristwatches. 4,064,688, Cl. 58-50.00R.
Sato, Kunio: *See*—
Nakaya, Keiichi; Hirata, Suekazu; and Sato, Kunio, 4,065,270, Cl. 23-299.000.
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Satomura, Masato, to Fuji Photo Film Co., Ltd. Functional group containing polymer and method of preparing the same. 4,065,430, Cl. 260-47.0UA.
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., to Cities Service Company. Tall oil defoamer for high strength acid media. 4,065,402, Cl. 252-358.000.
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., to Cities Service Company. Tall oil defoamer having a nonionic additive defoamer for high strength acid media. 4,065,403, Cl. 252-358.000.
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., to Cities Service Company. Tall oil defoamer for high strength acid media. 4,065,404, Cl. 252-358.000.
Sauer, Friedrich; and Muller, Klaus, to Glyco-Metallwerke Daelen & Loos GmbH. Mounting magazine for a galvanic fixture for electroplating semicylindrical articles. 4,065,378, Cl. 204-297.00W.
Sauer, Gale E., to Roblin Industries, Inc. Stabilizer strut for suspended ceiling system. 4,064,671, Cl. 52-696.000.
Sawada, Toshio; Yamamoto, Kimihiko; and Ishikawa, Hitoshi, to Aisin Seiki Kabushiki Kaisha. Pattern indicator mechanism for a sewing machine. 4,064,817, Cl. 112-158.00F.
Say, Geoffrey R.; Baird, William C., Jr.; and Kamienski, Paul W., to Exxon Research and Engineering Company. Maintaining effective molar ratio of HF to metal pentafluoride in a hydrocarbon conversion process. 4,065,381, Cl. 208-134.000.
Sayre, James Franklin; and Smale, Karl Harvey, to Du Pont de Nemours, E. I., and Company. Warp knit product and process. 4,064,712, Cl. 66-192.000.
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Krause, Erich; and Schieber, Hans, 4,064,711, Cl. 66-157.000.
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Holland, Eugene Richard; and Schlieman, Melvin Glynn, 4,064,997, Cl. 212-39.00B.
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Schneider, John R.; and Klyver, Kenneth B., to J.R. Schneider Co., Inc. Plate type filter apparatus. 4,065,390, Cl. 210-225.000.
Schnitzler, Alois. Stretcher. 4,064,574, Cl. 5-82.00R.
Schoenholz, Daniel: *See—*
Mackay, Donald A. M.; and Schoenholz, Daniel, 4,065,579, Cl. 426-3.000.
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Johnston, Herbert N.; Wray, Joseph A.; Robbins, Joe David; and Schrager, Morton, 4,065,304, Cl. 96-1.0LY.
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Schuh, Peter Otto, to Bell Telephone Laboratories, Incorporated. Power converter. 4,065,646, Cl. 179-170.00R.
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Schuman, Gordon A., to Dietzgen Corporation. Developing roller apparatus for reproduction machines. 4,064,933, Cl. 165-89.000.
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SCM Corporation: *See—*
Ting, Vincent Wen-Hwa, 4,065,587, Cl. 427-54.000.
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Webb, Walter J., 4,065,237, Cl. 417-503.000.
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Gotchel, Joel Peter; Norton, Henry James; and Spengos, Aris C., 4,064,600, Cl. 19-156.300.
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Seaholm, Reuel A., to Montgomery Elevator Company. Decorative jamb structure for elevator entranceways. 4,064,667, Cl. 52-204.000.
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Berard, Jean Claude, 4,065,660, Cl. 219-535.000.
Pauty, Bernard, 4,065,811, Cl. 366-244.000.
Secim: *See—*
Quehen, Andre; and Figueres, Roger, 4,064,929, Cl. 164-433.000.
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Kuist, Charles H.; Squitieri, Vincent; and Seeger, Richard E., 4,065,197, Cl. 339-17.00M.
Seha, Zdenek, to Ciba-Geigy AG. Process for the manufacture of α,α'-aminonitroanthraquinones. 4,065,478, Cl. 260-382.000.
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Okigami, Noboru; Sekiguchi, Yoshitoshi; Ito, Takusen; and Onose, Kenji, 4,065,247, Cl. 431-202.000.
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Selin, Terry G., to General Electric Company. Siloxanediolate complexes and preparation thereof. 4,065,482, Cl. 260-448.20E.
Sellinger, Du Wayne M.: *See—*
Wolbrink, David W.; Budyak, Robert J.; Sellinger, Du Wayne M.; and Kaepernick, William A., 4,064,798, Cl. 100-229.00A.
Selwitz, Charles M.: *See—*
Bacha, John D.; Matthews, Joseph S.; and Selwitz, Charles M., 4,065,470, Cl. 260-346.750.
Semel, Frederick J., to Alan Wood Steel Company. Rolled low carbon niobium steel. 4,065,331, Cl. 148-36.000.
Sendov, Stoyan Hristov; Nikolov, Ivan Angelov; Kuklin, Ivan Alexandrov; and Mirchev, Mircho Georgiev, to Chimkombinat. Conical centrifuge with continuous action. 4,065,393, Cl. 210-377.000.
Senger, Stephen J., to United States of America, Navy. Negative feedback amplifier and lever shifter. 4,065,726, Cl. 330-288.000.
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Contractor, Rashmikant Maganlal; Dodson, William Carter, Jr.; Hentges, James John; and Seppala, Earl Edwin, 4,064,597, Cl. 19-156.300.
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Serres, Carl, Jr., to Standard Oil Company (Indiana). Malonate ester chain coupling of polyesters. 4,065,440, Cl. 260-75.00R.
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Weber, Robert W., 4,064,951, Cl. 175-45.000.
Severinsen, John, to Metex Corporation. Metal mesh strip and embedded fin gasket for shielding against electromagnetic interference. 4,065,138, Cl. 277-230.000.
Seymour, Harold Henry: *See—*
Busdiecker, Wayne Scott; and Seymour, Harold Henry, 4,064,913, Cl. 138-125.000.
Shaner, Richard L.: *See—*
Ruark, Bruce J.; and Shaner, Richard L., 4,065,027, Cl. 220-343.000.
Sharp, John C.: *See—*
Moon, Malcolm W.; and Sharp, John C., 4,065,574, Cl. 424-283.000.
Sharp Kabushiki Kaisha: *See—*
Sasaki, Takehiko; and Nakamura, Tsutomu, 4,064,688, Cl. 58-50.00R.
Shasby, Patrick J.: *See—*
Kattner, Lionel E.; Youmans, Albert P.; and Shasby, Patrick J., 4,065,717, Cl. 324-158.00P.
Shearlock, David A.: *See—*
Chadwick, Ronald M.; and Shearlock, David A., 4,065,004, Cl. 214-36.000.
Sheffield, George V., to United States of America, Energy. Vertically stabilized elongated cross-section tokamak. 4,065,350, Cl. 176-3.000.
Sheinin, Viktor Efimovich: *See—*
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Prats, Michael, 4,064,942, Cl. 166-303.000.
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Shell, Irving Wardell. Upright and bracket arrangement. 4,065,088, Cl. 248-242.000.
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Cavin, Daniel C., 4,064,943, Cl. 166-281.
De Beukelaar, Jan W.; Van Zwet, Henry; and Roest, Jacob B., 4,065,610, Cl. 526-70.000.
Kim, Tae; Paxson, Timm E.; and Tang, Sunny C., 4,065,505, Cl. 260-600.00R.
McClure, James D.; and Brandenberger, Stanley G., 4,065,515, Cl. 260-683.680.
Potter, Richard C., 4,065,555, Cl. 424-83.000.
Powell, James E., 4,065,560, Cl. 424-246.000.
Soonawala, Homi D.; and den Broeder, Steven E., 4,065,379, Cl. 208-67.000.
Srinivasan, Krishnaswamy, 4,064,763, Cl. 73-516.00R.
Wicks, Moye, III; Kubitschek, Hans E.; and King, William E., 4,064,572, Cl. 4-227.000.
Shenoy, Umakant Devdas, to DDSA Pharmaceuticals Limited. 1,4-Benzodiazepine-2-amine derivatives. 4,065,474, Cl. 260-347.700.
Sherrill, John F. Injector for introducing a liquid into the cylinders of an internal combustion engine. 4,064,842, Cl. 123-25.00L.
Shibagaki, Masahiro: *See—*
Ogawa, Kazuyuki; Hirose, Masahiko; Shibagaki, Masahiro; Murakami, Yoshio; and Horiike, Yasuhiro, 4,065,369, Cl. 204-164.000.
Shibata, Norio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air supply system for internal combustion engines. 4,064,693, Cl. 60-290.000.
Shields, Theodore C., to Ashland Oil, Inc. Multiple metal deactivators, method for preparing, and use thereof. 4,065,498, Cl. 260-566.00F.
Shigemori, Youjiro; and Mitumori, Yoshio, to Star Seimitsu Kabushika Kaisha. Transistor blocking oscillator stabilized against changes in bias voltage and temperature. 4,065,733, Cl. 331-112.000.
Shii, Hikaru; and Oda, Eisuke, to Furukawa Electric Co. Ltd., The. Method of shaping oriented materials of polyolefin. 4,065,594, Cl. 428-113.000.
Shiley Laboratories, Inc.: *See—*
Johnson, George Michael; Krueger, Kenneth Keith; and Pavlov, Todor, 4,064,882, Cl. 128-351.000.
Lewin, John Edward, 4,065,264, Cl. 23-258.5BH.
Shillum, Robert L., to Shillum, Robert L. Rack system. 4,064,996, Cl. 211-191.000.
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Iwasaka, Tatsuo; Kaneko, Takashi; and Shimazaki, Seiichi, 4,064,971, Cl. 187-29.00R.

Shimizu, Akihiko: *See*—
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Shinosky, Leonard W., Jr. Electro-optical and electronic switching systems. 4,065,644, Cl. 179-18.0GF.

Shippey, Frederick Lee, to Eastman Kodak Company. Bleach-fix regeneration monitoring method. 4,065,313, Cl. 96-60.0BF.

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Ohnaka, Makoto, 4,065,001, Cl. 214-1.0BV.

Shoemaker, Brian C. Demountable extension enclosure for motor vehicles. 4,065,166, Cl. 296-23.00G.

Showa Koji K.K.: *See*—
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Shuster, Edward J.: *See*—
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Shutterly, Harold B., to Westinghouse Electric Corporation. Playback technique for an audio-video program wherein the video display is controlled by signals recorded as a part of the audio program. 4,065,794, Cl. 360-10.000.

Shutterly, Harold B., to Westinghouse Electric Corporation. Recording technique for an audio/video program wherein the audio incorporates video change signals. 4,065,795, Cl. 360-35.000.

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Shwayder, Warren M.; and Loftus, John T., 4,064,716, Cl. 70-38.00A.

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Siddall, Keith, to Osborn-Mushet Tools Limited. Twist drills. 4,065,224, Cl. 408-230.000.

Siegel, Eric. Video processing amplifier providing black level correction. 4,065,790, Cl. 358-172.000.

Siegelman, Abe: *See*—
Deisenroth, Norbert F.; Nordhaus, John P.; and Siegelman, Abe, 4,064,751, Cl. 73-207.000.

Siegwart, Hans-Rudolf; and Kaser, Rene, to Bureau BBR Ltd. Wedge push-in apparatus for a wire tensioning press. 4,065,098, Cl. 254-29.00A.

Siemens Aktiengesellschaft: *See*—
Ruhrnschopf, Ernst-Peter; and Linke, Gerhard, 4,065,397, Cl. 250-445.00T.

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Pacozzi, Pierino, 4,065,769, Cl. 343-17.700.

Sieverin, Walter Joseph, to American Can Company. Laboratory stand assembly. 4,064,737, Cl. 73-17.00R.

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Weman, Per Olaf, 4,065,069, Cl. 242-107.40A.

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Kattner, Lionel E.; Youmans, Albert P.; and Shasby, Patrick J., 4,065,717, Cl. 324-158.00P.
Russell, Lewis K., 4,065,680, Cl. 307-214.000.

Sikorra, Daniel J., to Honeywell Inc. Magnetically suspended angular momentum wheel. 4,065,189, Cl. 308-10.000.

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Amdall, John K.; and Simmons, Gerald P., 4,064,769, Cl. 74-878.000.
Stedman, Robert N.; and Simmons, Gerald P., 4,064,959, Cl. 180-139.000.

Simmons, James E.: *See*—
Whitted, Robert L.; and Simmons, James E., 4,064,686, Cl. 57-140.00J.

Simms, John E., to Design & Funding, Inc. Power steering pump bracket tool. 4,064,613, Cl. 29-407.000.

Simon, Helmut: *See*—
Hofer, Gerald; Bofinger, Gunter; Nothdurft, Heinz; Khosrawi, Mohammad-Ali; Simon, Helmut; and Konrath, Karl, 4,065,236, Cl. 417-493.000.

Simplex Filler Company: *See*—
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Singer Company, The: *See*—
Cummings, Thomas R.; and Mazza, Anthony J., Jr., 4,064,640, Cl. 35-12.00K.
Jaffe, Wolfgang; and Peterson, Wesley Robinson, 4,065,739, Cl. 335-234.000.

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Boeckman, Maynard A.; and Singer, Richard M., 4,064,719, Cl. 70-355.000.

Single Buoy Moorings Inc.: *See*—
Vogt, Christoph, 4,064,820, Cl. 114-74.00R.

Sinnema, Hendrik, to Machinefabriek W. Hubert & Co. B.V. Apparatus for manufacturing molded articles from a kneadable material, e.g., clay. 4,065,238, Cl. 425-94.000.

Sironval, Cyrille: *See*—
Dujardin, Esther; Kuiper, Ysbrand; Cremer, Rene; and Sironval, Cyrille, 4,065,310, Cl. 96-27.00R.

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Adcock, Willis A.; and Skaggs, Frank L., 4,065,785, Cl. 358-44.000.

Skare, Helge; and Hirschberg, Henry. Procedure and means for collecting liquid containing radioactive tracer elements. 4,065,383, Cl. 210-27.000.

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Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; Burkl, Erich; and Kiener, Heinz, 4,065,193, Cl. 308-233.000.
Hallerback, Stig Lennart, 4,065,190, Cl. 308-15.000.

SKF Industries, Inc.: *See*—
Kellstrom, Erik Magnus, 4,065,191, Cl. 308-202.000.

Skirvin, Willard L.: *See*—
Petersen, Virgil F.; and Skirvin, Willard L., 4,064,898, Cl. 137-240.000.

Sliwa, Robert A.; and Golden, Edward J., to Bendix Corporation, The. Digital apparatus for setting the voltage across a capacitor. 4,065,709, Cl. 320-1.000.

Sloan, Kenneth B.: *See*—
Bodor, Nicolae S.; Sloan, Kenneth B.; and Hussain, Anwar A., 4,065,566, Cl. 424-266.000.

Slobodyanik, Ivan Petrovich. Column apparatus for gas-liquid heat and mass exchange processes. 4,065,528, Cl. 261-114.00R.

Sly, Steve R. Alarm device for a campsite. 4,064,825, Cl. 116-81.000.

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Sayre, James Franklin; and Smale, Karl Harvey, 4,064,712, Cl. 66-192.000.

Smith, Charles G., to Upjohn Company, The. Tubercidin preparation. 4,065,556, Cl. 424-181.000.

Smith, Donald M. Apparatus and method for mixing separated fluids downhole. 4,064,941, Cl. 166-300.000.

Smith, Frederick W.: *See*—
Palfreeman, John S.; Redwood, Martin; Smith, Frederick W.; and Mitchell, Richard F., 4,065,735, Cl. 333-72.000.

Smith, Harry: *See*—
Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, 4,065,457, Cl. 260-289.00K.

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Huffman, Jerry P.; LaForest, John P.; Petit, William A.; and Smith, James A., 4,065,081, Cl. 246-34.00R.

Smith, Lester L. Top guide pivot for bifold doors. 4,064,590, Cl. 16-90.000.

Smith, Spencer E.; and Marek, Donald C., to International Harvester Company. Detent mechanism with arc travel limiter. 4,064,768, Cl. 74-528.000.

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Reynolds, Charles A., 4,064,741, Cl. 73-620.000.

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Cecere, Francesco; Galli, Giuliano; Della Penna, Gino; and Rappuoli, Bruno, 4,065,353, Cl. 195-2.000.

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Cunningham, James Thomas; Snow, Frederick Orren, III; April, Joseph Richard; and Yu, A. Tobey, 4,065,002, Cl. 214-14.000.

Sobozenski, Theodore M.; and Stupak, Raymond E., to Sprague Electric Company. Method for terminating solid electrolyte capacitors. 4,064,611, Cl. 29-270.000.

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Provendier, Jacques Henri, 4,065,641, Cl. 179-15.0AT.

Societe Anonyme Francaise du Ferodo: *See*—
Filderman, Rene, 4,064,974, Cl. 188-71.300.
Filderman, Rene Gabriel, 4,064,975, Cl. 188-73.500.

Societe de Diffusion NEIMAN: *See*—
Neiman, Michel, 4,064,717, Cl. 70-165.000.

Societe de Vente de l'Aluminium Pechiney: *See*—
Nicoud, Jean-Claude, 4,065,326, Cl. 148-2.000.
Quehen, Andre; and Figueres, Roger, 4,064,929, Cl. 164-433.000.

Societe des Accumulateurs Fixes et de Traction: *See*—
Godard, Pierre; and Lapuyade, Robert Henri, 4,065,712, Cl. 320-39.000.

Societe des Etablissements Hugonnet: *See*—
Cainaud, Henri, 4,065,022, Cl. 220-71.000.

Societe Nationale des Poudres et Explosifs: *See*—
Lorson, Pierre Michel; and Dumas, Bernard Roger, 4,065,332, Cl. 149-19.900.

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Erni, Bruno; and Meister, Pierre-Andre, 4,065,651, Cl. 200-5.00A.

Solden, LeRoy, to Widen Tool & Stamping, Inc. Mountable attachment. 4,065,087, Cl. 248-201.000.

Sommer, August: *See*—
Wessendorf, Richard; Sommer, August; and Birkelbach, Heinrich, 4,065,506, Cl. 260-601.00R.

Sonetaka, Kazunori: *See*—
Nishino, Atsushi; Sonetaka, Kazunori; and Kimura, Kunio, 4,065,406, Cl. 252-443.000.

Soonawala, Homi D.; and den Broeder, Steven E., to Shell Oil Company. Process for the production of normally gaseous olefins. 4,065,379, Cl. 208-67.000.

Sorkin, Howard: *See*—
Stern, Herman Abraham; Sorkin, Howard; and Schindler, Henry Claude, 4,064,919, Cl. 141-7.000.

Soulsby, John E.; and Malecha, Richard J., to Towmotor Corporation. Noise enclosure for hydraulic valve. 4,064,903, Cl. 137-375.000.

SouthCom, Inc.: *See*—
Spinks, Maurice H., Sr.; and Juge, Yvon E., 4,065,092, Cl. 248-503.000.

Spanel, Abram N.; Eiland, P. Frank; and Jacobs, David R., to Spanel, Abram N. Double select needle tufting machine. 4,064,816, Cl. 112-79.00A.

Spangler, Paul Joseph, to International Telephone and Telegraph

Corporation. Separable funnel guide and crimping die assembly. 4,064,624, Cl. 29-753.000.
Spaniola, James W.: *See—*
Duncan, Eugene G.; and Spaniola, James W., 4,065,750, Cl. 340-58.000.
Sparks, Buddy G.: *See—*
Murphy, Frank W., Jr.; and Sparks, Buddy G., 4,064,752, Cl. 73-302.000.
Sparlin, Derry D., to Continental Oil Company. Water control with polymers. 4,064,940, Cl. 166-295.000.
Sparwald, Volker: *See—*
Weckesser, Ernst; Sparwald, Volker; Reh, Lothar; Bohm, Eberhard; and Graf, Rolf, 4,065,271, Cl. 55-2.000.
Speece, Richard E. Gas flow totalizer. 4,064,750, Cl. 73-194.00R.
Spengos, Aris C.: *See—*
Gotchel, Joel Peter; Norton, Henry James; and Spengos, Aris C., 4,064,600, Cl. 19-156.300.
Sperry Rand Corporation: *See—*
Anderson, David Robert; Anderson, Wilbert Cleon; and Jenkins, Vaughn Junior, 4,065,074, Cl. 242-184.000.
Minden, Henry T., 4,065,730, Cl. 331-94.50H.
Paccione, Sebastian W.; and Risnychok, Theodore J., 4,064,800, Cl. 101-93.140.
Spielberger, Georg; Wunderlich, Hermann; Klag, Gunther; and Zlokarnik, Marko, to Bayer Aktiengesellschaft. Process for preparing aminonaphthalene derivatives in a titanium or titanium alloy reactor. 4,065,492, Cl. 260-508.000.
Spinks, Maurice H., Sr.; and Juge, Yvon E., to SouthCom, Inc. Quick release security latch device for radio antenna base. 4,065,092, Cl. 248-503.000.
Spinner, David, to Unisette Realty Ltd. Combination lawn mower, snow blower and lawn sweeper. 4,064,679, Cl. 56-2.000.
Spitz, Eric: *See—*
Micheron, Francois; Doriath, Gerard; and Spitz, Eric, 4,065,677, Cl. 307-112.000.
Spitzer, Wayne Alfred, to Eli Lilly and Company. Process for 3-H-3-cephem esters. 4,065,618, Cl. 544-16.000.
Spitzer, Wayne Alfred, to Eli Lilly and Company. Process for 3-alkyl and 3-phenyl cephalosporins. 4,065,621, Cl. 544-30.000.
Sprague Electric Company: *See—*
Sobozenski, Theodore M.; and Stupak, Raymond E., 4,064,611, Cl. 29-270.000.
Sprecher & Schuh AG: *See—*
Unterweger, Heinz; and Gremaud, Maurice, 4,065,805, Cl. 361-196.000.
Sprunck, E.: *See—*
Leroy, Pierre; and Sprunck, Emile, 4,065,159, Cl. 285-136.000.
Sprunck, Emile: *See—*
Leroy, Pierre; and Sprunck, Emile, 4,065,159, Cl. 285-136.000.
Square D Company: *See—*
Clarke, Geoffrey, 4,065,683, Cl. 307-264.000.
Squitieri, Vincent: *See—*
Kuist, Charles H.; Squitieri, Vincent; and Seeger, Richard E., 4,065,197, Cl. 339-17.00M.
Srinivasan, Krishnaswamy, to Shell Oil Company. Accelerometer for measuring pump rod displacement. 4,064,763, Cl. 73-516.00R.
Stal-Laval Turbin AB: *See—*
Wikner, Jan Christer, 4,064,762, Cl. 73-487.000.
Standard Modern Tool Company Limited: *See—*
Maddock, William Harvard, 4,064,774, Cl. 82-45.000.
Standard Oil Company: *See—*
Fields, Ellis K.; Zimmerschied, Wilford J.; and Palmer, David A., 4,065,442, Cl. 260-78.410.
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Robert C., 4,065,468, Cl. 260-346.750.
Hardman, Harley F.; Callahan, James L.; and Grasselli, Robert K., 4,065,507, Cl. 260-604.00R.
Standard Oil Company (Indiana): *See—*
Bateman, Mark E.; and Palmer, Jeffrey T., 4,065,349, Cl. 162-158.000.
Fast, Clarence R., 4,064,938, Cl. 166-236.000.
Serres, Carl, Jr., 4,065,440, Cl. 260-75.00R.
Stanfield, Zenas Allen, to Ciba-Geigy AG. Apparatus for drying seeds. 4,064,638, Cl. 34-174.000.
Stapp, Willis J.; and Honnert, Quentin E., to Multifold-International, Inc. Machine for opening, inspecting and packing a folding carton. 4,064,675, Cl. 53-54.000.
Star Seimitsu Kabushika Kaisha: *See—*
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Stedman, Robert N.; and Simmons, Gerald P., to Caterpillar Tractor Co. Steering arrangement for a double articulated wheel tractor. 4,064,959, Cl. 180-139.000.
Steere, Stephen D. Tennis ball holder. 4,065,040, Cl. 224-5.00D.
Stegavig, Clifford Arnold; and Stringer, David McNair. Wrap-around roof rack. 4,065,041, Cl. 224-42.10D.
Steierman, Bernard L., to Owens-Illinois, Inc. Cathode-ray tube. 4,065,696, Cl. 313-480.000.
Steierman, Bernard L., to Owens-Illinois, Inc. Cathode-ray tube. 4,065,697, Cl. 313-480.000.
Stein, Robert R., to Hardware Designers, Inc. Positive action front release drawer slide assembly. 4,065,196, Cl. 312-333.000.
Steinke, Leo: *See—*
Hacker, Wolf-Dieter; Friese, Karl-Hermann; Steinke, Leo; and Weyl, Helmut, 4,065,372, Cl. 204-195.00S.
Steinstrasser, Rolf; and Del Pino, Fernando, to Merck Patent Gesellschaft mit beschrankter Haftung. Biphenyl esters and liquid crystalline mixtures comprising them. 4,065,489, Cl. 560-59.000.
Stephens, James B.: *See—*
Fletcher, James C.; Miller, Charles G.; and Stephens, James B., 4,065,053, Cl. 237-1.00A.
Stephens, Raymond E., Jr. Evaporative roof cooling system. 4,064,706, Cl. 62-64.000.
Sterling Drug Inc.: *See—*
Dickinson, William B., 4,065,471, Cl. 260-326.00N.
Jefferies, Patrick J.; and Crounse, Nathan N., 4,065,500, Cl. 260-567.60M.
Stern, Herman Abraham; Sorkin, Howard; and Schindler, Henry Claude, to RCA Corporation. Method of filling dynamic scattering liquid crystal devices. 4,064,919, Cl. 141-7.000.
Stern, Louis P., to Westinghouse Electric Corporation. Boiler control having a heating value computer and providing improved operation with fuels having variable heating values. 4,064,698, Cl. 60-664.000.
Stewart, John A.; Hynes, Roy G.; Beyerlein, David G.; and Force, John B., to General Motors Corporation. Warning circuit for a tractor/-trailer combination. 4,065,751, Cl. 340-58.000.
Stewart-Warner Corporation: *See—*
Fontana, Frank J., 4,065,176, Cl. 297-304.000.
Stewart, Wilber Clarence, to RCA Corporation. Videodisc playback system. 4,065,786, Cl. 358-128.000.
Stifab AB: *See—*
Nilsson, Allan Elvir, 4,064,905, Cl. 137-499.000.
Stokes, Alvin R. Billiard glove. 4,054,563, Cl. 2-161.00A.
Stoner, Glenn E.; and Zardiackas, Lyle D., to University of Virginia, The. Cavity liner for dental restorations. 4,064,629, Cl. 32-15.000.
Stoppani S.A., Etablissements pour la mecanique de precision et l'electro-mecanique: *See—*
Rouiller, Jean Marie, 4,065,640, Cl. 179-7.1TP.
Storage Technology Corporation: *See—*
Kaczeus, Steven L., 4,065,799, Cl. 360-135.000.
Straitz, John F., III; and Mendoza, Vicente A., to National Airoil Burner Co., Inc. Ground flare. 4,065,248, Cl. 431-202.000.
Strathearn Audio Limited: *See—*
Ridler, Keith Douglas; Gosling, Alexander Bennett; and Edge, Gordon Malcolm, 4,065,188, Cl. 308-10.000.
Stratienko, Andrew. Liquid pump sealing system. 4,065,232, Cl. 417-368.000.
Strelitz, Robert A.: *See—*
Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,065,497, Cl. 260-563.00P.
Strella, Stephen: *See—*
Jelfo, Raymond L.; Strella, Stephen; and Hamilton, Willard C., 4,065,585, Cl. 427-11.000.
Strickland, John C.: *See—*
MacLean, John P.; and Strickland, John C., 4,064,756, Cl. 73-349.000.
Strike, Donald Peter, to American Home Products Corporation. 15-Substituted prostanoic acids. 4,065,494, Cl. 260-514.00D.
Stringer, David McNair: *See—*
Stegavig, Clifford Arnold; and Stringer, David McNair, 4,065,041, Cl. 224-42.10D.
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Stuhler, Harold A.: *See—*
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,065,402, Cl. 252-358.000.
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,065,403, Cl. 252-358.000.
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,065,404, Cl. 252-358.000.
Stumpe, Warren R., to Rexnord Inc. Label system for package and baggage handling. 4,065,343, Cl. 156-212.000.
Stupak, Raymond E.: *See—*
Sobozenski, Theodore M.; and Stupak, Raymond E., 4,064,611, Cl. 29-270.000.
Stupperich, Robert: *See—*
Pels-Leusden, Carl Otto; Stupperich, Robert; Weber, Hans-Bernd; and Reinders, Rudi, 4,064,639, Cl. 34-212.000.
Stutzinger, Ferdinand: *See—*
Bohn, Hans; and Stutzinger, Ferdinand, 4,065,445, Cl. 260-112.00B.
Subramanian, Kohur Nagaraja; and Glaum, Gerald Vernon, to International Nickel Company, Inc., The. Two stage leaching of limonitic ore and sea nodules. 4,065,542, Cl. 423-35.000.
Suddeutsche Kuhlerfabrik Julius Fr. Behr: *See—*
Pabst, Rolf; and Jenz, Siegfried, 4,064,848, Cl. 123-41.540.
Sugisaki, Tsutomu; and Watanabe, Hideomi, to Fuji Photo Film Co., Ltd. Cleaning cartridge. 4,065,798, Cl. 360-128.000.
Suhara, Manabu: *See—*
Oda, Yoshio; Suhara, Manabu; and Endo, Eiji, 4,065,366, Cl. 204-98.000.
Suit, Leslie David: *See—*
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Sumitomo Bayer Urethane Co., Ltd.: *See—*
Kataoka, Yushin; Harada, Tetsuo; and Takagi, Kenji, 4,065,362, Cl. 203-58.000.
Sumitomo Chemical Company, Limited: *See—*
Sasajima, Kikuo; Ono, Keiichi; Nakao, Masaru; Maruyama, Isamu; Katayama, Shigenari; Inaba, Shigeho; and Yamamoto, Hisao, 4,065,565, Cl. 424-250.000.

Sumitomo Metal Industries Limited: *See*—
Sasaki, Kantaro; Ikeda, Takami; Matsuo, Tohru; and Okazaki, Takashi, 4,065,297, Cl. 75-52.000.

Sun Oil Company of Pennsylvania: *See*—
Gayle, Harold R.; and Wagner, Walter D., 4,064,889, Cl. 137-68.00R.

Sun, Robert J.; and Maltby, Frederick L., to Drexelbrook Controls, Inc. RF admittance measuring method and apparatus for determining the level of a conductive liquid. 4,064,753, Cl. 73-304.00C.

Sunbury, Robert: *See*—
Brossi, Arnold; Pecherer, Benjamin; and Sunbury, Robert, 4,065,473, Cl. 260-340.50R.

Sund, Joseph T., to A. B. Dick Company. Apparatus for sensing the concentration of toner in a developer mix. 4,064,834, Cl. 118-646.000.

Sunkist Growers, Inc.: *See*—
Nelson, Denny B., 4,065,614, Cl. 536-2.000.

Super Strut, Inc.: *See*—
Biggane, John D., 4,065,218, Cl. 403-71.000.

Suresh, Dev D.: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Robert C., 4,065,468, Cl. 260-346.750.

Suzuki, Seigo; and Eguchi, Seiji, to Tokyo Shibaura Electric Co., Ltd. Synchronous transmission control system. 4,065,639, Cl. 178-69.100.

Suzuki, Yasoji; Tokumaru, Yukuya; and Nakai, Masanori, to Tokyo Shibaura Electric Co., Ltd. Semiconductor latch circuit using integrated logic units and Schottky diode in combination. 4,065,187, Cl. 307-279.000.

Svenska Sockerfabriks AB: *See*—
Glifberg, Nils Bertil, 4,064,681, Cl. 56-121.450.

Svensson, Sven-Hakan: *See*—
Eklund, John Folke; and Svensson, Sven-Hakan, 4,064,787, Cl. 89-34.000.

Swan, Walter B. Polygonal carton with bottom reinforcement and blank therefor. 4,065,047, Cl. 229-41.00C.

Swanson, Harold, to Baker Brush Co., Inc. Paint brush merchandising display. 4,064,991, Cl. 211-49.00R.

Sweezey, Charles R. Fence attachment. 4,065,103, Cl. 256-11.000.

Swenson, John Gordon. Curb box. 4,064,902, Cl. 137-370.000.

Swenson, Rudolph E. Tongue blade for mouth gag. 4,064,873, Cl. 128-12.000.

Swett, Alan M.; and Swift, Roderick D., to United States of America, Health, Education and Welfare. Cable handling. 4,065,066, Cl. 242-47.120.

Swift, Harold E.; and Vogel, Roger F., to Gulf Research & Development Company. Hydrodenitrification using a tungsten containing Ni-SMM composite catalyst. 4,065,380, Cl. 208-89.000.

Swift, Roderick D.: *See*—
Swett, Alan M.; and Swift, Roderick D., 4,065,066, Cl. 242-47.120.

Switall, Thomas G., to Ryco Graphic Manufacturing, Inc. Spray dampening system for offset printing. 4,064,801, Cl. 101-147.000.

Syaskin, Jury Mikhailovich: *See*—
Beizerov, Semen Moiseevich; Vyboischikov, Felix Petrovich; Bloshenko, Vladimir Viktorovich; and Syaskin, Jury Mikhailovich, 4,065,634, Cl. 13-10.000.

Sybron Corporation: *See*—
Farabaugh, Patrick, 4,065,391, Cl. 210-274.000.

Syntex Puerto Rico, Inc.: *See*—
Lundquist, Ingemar H., 4,064,878, Cl. 128-206.000.

Syntex (U.S.A.) Inc.: *See*—
Li, Tsung-tee; Marx, Michael; and Throop, Lewis J., 4,065,452, Cl. 260-239.55D.

Syva Company: *See*—
Ullman, Edwin F.; and Rubenstein, Kenneth E., 4,065,354, Cl. 195-63.000.

Szasz, Kalman: *See*—
Lorincz, Csaba; Szasz, Kalman; Bolyos, Maria; Jovanovics, Karola; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,065,458, Cl. 260-293.550.

Szewczyk, Andrew J.: *See*—
Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., 4,065,222, Cl. 407-18.000.

Szporny, Laszlo: *See*—
Lorincz, Csaba; Szasz, Kalman; Bolyos, Maria; Jovanovics, Karola; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,065,458, Cl. 260-293.550.

Taborsky, Jiri. Aquatic tank. 4,064,836, Cl. 119-3.000.

Tachibana, Katsuhiko: *See*—
Masui, Akira; Yamada, Kenzo; Ninomiya, Akinori; Tachibana, Katsuhiko; and Kato, Yoshihiro, 4,065,298, Cl. 75-60.000.

Taga Electric Co., Ltd.: *See*—
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Takagi, Kenji: *See*—
Kataoka, Yushin; Harada, Tetsuo; and Takagi, Kenji, 4,065,362, Cl. 203-58.000.

Takahashi, Kooji; Kojima, Tatsuji; Ishikawa, Teruo; Nakamura, Kimio; and Ikenaga, Shizuyoshi, to Toray Industries, Inc. Process for polymeric modification of a fiber. 4,065,598, Cl. 428-394.000.

Takahashi, Norio: *See*—
Tsuneki, Takao; Takahashi, Norio; and Tashiro, Hirohisa, 4,065,387, Cl. 210-62.000.

Takahashi, Yutaka; Hakamata, Yoshio; and Konno, Masamitu, to Fuji Photo Film Co., Ltd. Microfilm inserter. 4,064,677, Cl. 53-123.000.

Takamiya, Kikuzo: *See*—
Ohtani, Kiyoshi; and Takamiya, Kikuzo, 4,064,972, Cl. 188-24.000.

Takasaki, Takao. Nursing carriage. 4,065,179, Cl. 297-384.000.

Takeda Chemical Industries, Ltd.: *See*—
Horii, Satoshi; Kameda, Yukihiko; and Mizokami, Nariakira, 4,065,615, Cl. 536-10.000.
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; and Minami, Isao, 4,065,619, Cl. 544-25.000.

Takemura, Seiji: *See*—
Torigoe, Masao; Mori, Kunihito; Tsuchiya, Mitsuru; and Takemura, Seiji, 4,065,233, Cl. 417-368.000.

Takeno, Shouzo; Mashita, Masao; and Onodera, Toshihiro, to Tokyo Shibaura Electric Co., Ltd. Elastic surface wave devices. 4,065,734, Cl. 333-30.00R.

Takeshita, Kanou: *See*—
Miura, Genmei; and Takeshita, Kanou, 4,065,754, Cl. 340-166.00R.

Tanaka, Hiroshi; and Yamamoto, Yoshihiro, to NGK Spark Plug Co., Ltd. Method for producing titanium nitride-base sintered alloys. 4,065,301, Cl. 75-203.000.

Tanaka, Yutaka; Kondo, Yutaka; and Yamanaka, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seat belt system. 4,065,156, Cl. 280-747.000.

Tang, Sunny C.: *See*—
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,065,505, Cl. 260-600.00R.

Tanimura, Kaoru: *See*—
Nakagawa, Kazuyuki; Murakami, Nanami; Mori, Hideo; and Tanimura, Kaoru, 4,065,456, Cl. 260-289.00R.

Tanji, Akinori: *See*—
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Tanner, Herbert: *See*—
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Tashiro, Hirohisa: *See*—
Tsuneki, Takao; Takahashi, Norio; and Tashiro, Hirohisa, 4,065,387, Cl. 210-62.000.

Tatyanchikov, Valentin Alexeevich: *See*—
Evkin, Ivan Frolovich; Petrov, Vladimir Alexandrovich; Olevsky, Viktor Markovich; Ruchinsky, Vitaly Rafael-Abovich; Bushev, Vladimir Semenovich; and Tatyanchikov, Valentin Alexeevich, 4,065,346, Cl. 159-6.00R.

Tausch, Gerald, to Miller-Holzwarth, Inc. Ballistic protected periscope construction. 4,065,206, Cl. 350-301.000.

Tayco Development, Inc.: *See*—
Taylor, Douglas P., 4,064,977, Cl. 188-317.000.

Taylor, Douglas P., to Tayco Development, Inc. Fluid amplified shock absorber having DeLaval nozzle. 4,064,977, Cl. 188-317.000.

Taylor, Harold Mellon, to Eli Lilly and Company. Herbicidal β-phenyl-4-piperidinones. 4,065,290, Cl. 71-94.000.

Taylor, Lynn J.: *See*—
Lenard, William; and Taylor, Lynn J., 4,065,589, Cl. 428-35.000.

Taylor, Thomas D.: *See*—
Frantz, Virgil L.; and Taylor, Thomas D., 4,065,096, Cl. 251-137.000.

Teibow Company Limited: *See*—
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Telatemp Corporation: *See*—
Darringer, Richard E.; and Wrighton, Robert J., 4,064,827, Cl. 116-114.00Y.

Teledyne Electro Mechanisms: *See*—
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Teledyne Industries, Inc.: *See*—
Roberts, Gregory Todhunter; Owens, David Vincent; and Goodspeed, Raymond Frank, 4,065,299, Cl. 75-67.00A.
Trenary, John, 4,064,896, Cl. 137-218.000.

Telefonaktiebolaget L M Ericsson: *See*—
Lundkvist, Bror Ludvig; Lindeberg, Sven-Erik; and Forsberg, Karl Sievert, 4,065,652, Cl. 200-175.000.

Teletype Corporation: *See*—
Babler, Egon S., 4,064,799, Cl. 101-93.020.
Berry, James M., 4,065,773, Cl. 346-75.000.
Heeren, Richard H., 4,065,679, Cl. 307-251.000.

Tennes, Bernard R.; and Burton, Clyde L., to United States of America, Agriculture. Continuous mechanized harvesting of horticultural crops. 4,064,683, Cl. 56-328.0TS.

Teti, John J., to Pyott-Boone Machinery, Corporation. Portable water scoop. 4,065,011, Cl. 214-146.00E.

Teti, Joseph A., Jr.; and Peroni, Peter A., to LaFrance Precision Casting Company. Tool box handle. 4,064,594, Cl. 16-125.000.

Texaco Development Corporation: *See*—
Gipson, Robert Malone, 4,065,476, Cl. 260-348.290.

Texaco Inc.: *See*—
Bartley, Burton H.; and Estes, John H., 4,065,514, Cl. 260-676.00R.
Lachowicz, Donald R.; and Holder, Charles B., 4,065,521, Cl. 260-879.000.
MacLean, John P.; and Strickland, John C., 4,064,756, Cl. 73-349.000.
Pittman, Robert W.; and Hermes, Chester E., 4,064,749, Cl. 73-152.000.
Pogonowski, Ivo C., 4,064,703, Cl. 61-53.680.

Texas Instruments Incorporated: *See*—
Adcock, Willis A.; and Skaggs, Frank L., 4,065,785, Cl. 358-44.000.
Kendall, Don Leslie; and Judy, Millard Monroe, 4,065,742, Cl. 338-9.000.

Theodore, Ares N.: *See*—
Labana, Santokh S.; and Theodore, Ares N., 4,065,518, Cl. 260-836.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H. Mobile apparatus for non-stop track leveling and ballast tamping. 4,064,807, Cl. 104-7.00A.
Thiele, Gerhard: *See—*
Zollner, Christine; Thiele, Gerhard; Zollner, Dieter; and Koziol, Konrad, 4,065,377, Cl. 204-290.00F.
Thielen, Gunter: *See—*
Wild, Hans; Jeckel, Guenter; Echte, Adolf; Zizlsperger, Johann; Reffert, Rudi Wilhelm; and Thielen, Gunter, 4,065,532, Cl. 264-68.000.
Thomas & Betts Corporation: *See—*
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Thomas, Harris B.: *See—*
Mahle, Howard C.; and Thomas, Harris B., 4,065,005, Cl. 214-41.00R.
Thomas, Wolfram: *See—*
Grundei, Hans; and Thomas, Wolfram, 4,064,568, Cl. 3-1.911.
Thompson, John R., to United States of America, Navy. Device for measuring the velocity of a body in an undersea environment. 4,065,746, Cl. 340-5.00S.
Thomson-CSF: *See—*
Mayeux, Christian; Micheron, Francois; and Vasseur, Jean Pierre, 4,065,671, Cl. 250-370.000.
Micheron, Francois; Doriath, Gerard; and Spitz, Eric, 4,065,677, Cl. 307-112.000.
Thornburg, Russell B., to Global Marine, Inc. Self-contained mooring system for a drill ship. 4,064,822, Cl. 114-230.000.
Thornton, William A., to Westinghouse Electric Corporation. High-pressure mercury-vapor discharge lamp having a light output with incandescent characteristics. 4,065,688, Cl. 313-25.000.
Thorpe, John Anton; and Porter, Harold Felton, to Du Pont de Nemours, E. I., and Company. Process for recovery of products from a waste stream in the manufacture of acrylonitrile. 4,065,486, Cl. 260-465.300.
Thorsheim, Ivar. Method and an apparatus for addressing and stacking individual pieces of printed matter for mailing, especially magazine copies, booklets and other bindery articles. 4,065,117, Cl. 270-58.000.
Threatt, Grace J. Combined baby bottle holder and mattress cover. 4,064,576, Cl. 5-334.00C.
Three Rivers Aluminum Company: *See—*
Randall, Robert P.; and Torbett, Richard L., 4,064,653, Cl. 49-458.000.
Throop, Lewis J.: *See—*
Li, Tsung-tee; Marx, Michael; and Throop, Lewis J., 4,065,452, Cl. 260-239.55D.
Thrower, William F.: *See—*
Lee, Don H.; Weller, Kenneth P.; Ying, Robert S.; and Thrower, William F., 4,064,620, Cl. 29-580.000.
Tibolla, Marcello: *See—*
Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, 4,065,467, Cl. 260-345.200.
Tiedeman, George T.: *See—*
Oita, Katashi; San Clemente, Marion R.; Oh, John H.; and Tiedeman, George T., 4,065,576, Cl. 424-318.000.
Oita, Katashi; San Clemente, Marion R.; Oh, John H.; and Tiedeman, George T., 4,065,577, Cl. 424-333.000.
Tilley, James N.: *See—*
Andrews, Philip S.; Farrissey, William J., Jr.; Onder, Besir K.; and Tilley, James N., 4,065,441, Cl. 260-78.00R.
Tilly, Guy; Hardouin, Michel Jean Charles; and Lautrou, Jean, to Laboratoires Andre Guerbet. X-Ray contrast media. 4,065,553, Cl. 424-5.000.
Tilly, Guy; Hardouin, Michel Jean Charles; and Lautrou, Jean, to Laboratoires Andre Guerbet. X-ray contrast media. 4,065,554, Cl. 424-5.000.
Timerax Holdings Ltd.: *See—*
Phipps, Frank T., 4,064,571, Cl. 4-172.190.
Timin, Mitchell E., to Airco, Inc. Slot sealing valve for vacuum coating apparatus. 4,065,097, Cl. 251-228.000.
Ting, Vincent Wen-Hwa, to SCM Corporation. U.V. Curable poly(ether-urethane) polyacrylates and wet-look polymers prepared therefrom. 4,065,587, Cl. 427-54.000.
Tinholt, Thomas H., to Eaton Corporation. Dual speed viscous fluid coupling. 4,064,980, Cl. 192-58.00B.
Tipper, John M. Plow cutter assembly. 4,065,184, Cl. 299-34.000.
Todd & Sargent, Inc.: *See—*
Mahle, Howard C.; and Thomas, Harris B., 4,065,005, Cl. 214-41.00R.
Toeppen, Thurston H. Fastening device for print head. 4,064,984, Cl. 197-52.000.
Tokumaru, Yukuya: *See—*
Suzuki, Yasoji; Tokumaru, Yukuya; and Nakai, Masanori, 4,065,187, Cl. 307-279.000.
Tokura, Masayuki: *See—*
Kawaguchi, Yoshihiko; Harada, Yoshimi; Miki, Makoto; Gouda, Kanenari; Akiyama, Masaharu; Tokura, Masayuki; and Kuroha, Jun, 4,065,419, Cl. 260-28.50D.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Iwai, Naoji; Uchida, Takashi; and Abe, Takemi, 4,065,625, Cl. 428-596.000.
Iwano, Yoshihiko; and Une, Katsumi, 4,065,352, Cl. 176-68.000.
Maeyama, Shigeo, 4,065,690, Cl. 313-57.000.
Matsumoto, Mitsuo, 4,065,809, Cl. 364-200.000.
Ogawa, Kazuyuki; Hirose, Masahiko; Shibagaki, Masahiro; Murakami, Yoshio; and Horiike, Yasuhiro, 4,065,369, Cl. 204-164.000.
Suzuki, Seigo; and Eguchi, Seiji, 4,065,639, Cl. 178-69.100.
Suzuki, Yasoji; Tokumaru, Yukuya; and Nakai, Masanori, 4,065,187, Cl. 307-279.000.
Takeno, Shouzo; Mashita, Masao; and Onodera, Toshihiro, 4,065,734, Cl. 333-30.00R.
Tolnai, Julius L., to Price Pfister Brass Mfg. Co. Washerless cartridge valve for faucets. 4,064,904, Cl. 137-454.500.
Toplan Manufacturing Inc.: *See—*
Otsuka, Katsumi, 4,065,215, Cl. 401-199.000.
Topolyansky, Jury Arnoldovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Lurie, Mikhail Vladimirovich; Topolyansky, Jury Arnoldovich; Kantor, Ilya Solomonovich; Chizhikov, Anatoly Petrovich; and Gun, Dmitry Rudolfovich, 4,065,076, Cl. 243-38.000.
Toray Industries, Inc.: *See—*
Hosoi, Kazuo; Kawabe, Norio; and Ohno, Masaji, 4,065,475, Cl. 260-348.310.
Kinoshita, Yoshiro, 4,065,549, Cl. 423-447.400.
Nishiumi, Shiro; Hasegawa, Shoichi; Mizoguchi, Toshiyuki; and Furuta, Sachiko, 4,065,599, Cl. 428-402.000.
Takahashi, Kooji; Kojima, Tatsuji; Ishikawa, Teruo; Nakamura, Kimio; and Ikenaga, Shizuyoshi, 4,065,598, Cl. 428-394.000.
Torbett, Richard L.: *See—*
Randall, Robert P.; and Torbett, Richard L., 4,064,653, Cl. 49-458.000.
Torigoe, Masao; Mori, Kunihito; Tsuchiya, Mitsuru; and Takemura, Seiji, to Matsushita Electric Industrial Co., Ltd. Electric blower assembly having volute passages to direct air into motor housing. 4,065,233, Cl. 417-368.000.
Torquato, Michael. Rotary engine. 4,064,697, Cl. 60-624.000.
Towmotor Corporation: *See—*
Leskovec, Edward V.; and Porter, Ralph D., 4,065,112, Cl. 267-34.000.
Soulsby, John E.; and Malecha, Richard J., 4,064,903, Cl. 137-375.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Igeta, Kikuji; and Ohguchi, Masakatsu, 4,065,256, Cl. 8-115.500.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Seita, Toru; and Shimizu, Akihiko, 4,065,414, Cl. 260-17.00R.
Toyobo Co., Ltd.: *See—*
Akiyama, Takashi; Tanji, Akinori; Ikeda, Hideo; and Asano, Seiichi, 4,064,605, Cl. 28-103.000.
Uno, Keiichi; and Miyagawa, Takahito, 4,065,439, Cl. 260-75.00R.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kato, Takashi, 4,064,860, Cl. 123-191.00S.
Shibata, Norio, 4,064,693, Cl. 60-290.000.
Tanaka, Yutaka; Kondo, Yutaka; and Yamanaka, Akira, 4,065,156, Cl. 280-747.000.
Tracor, Inc.: *See—*
Anthony, Albert M., 4,065,737, Cl. 335-212.000.
Travers, William S.: *See—*
Vercellone, Mario J.; and Travers, William S., 4,064,646, Cl. 43-42.410.
Treadwell, John William. Adding machine tape reversing rewinder. 4,065,068, Cl. 242-67.10R.
Trenary, John, to Teledyne Industries, Inc. Vacuum breakers. 4,064,896, Cl. 137-218.000.
Treslo, Angelo. Lock bar assembly. 4,064,714, Cl. 70-18.000.
Triplex Safety Glass Company Limited: *See—*
King, Robert David; Hiscutt, Robert; and Molineux, Peter, 4,065,600, Cl. 428-432.000.
Triumph Werke Nurnberg A.G.: *See—*
Anton, Rainer; Beyer, Ernst; and Bielefeld, Bodo, 4,064,982, Cl. 197-1.00R.
TRW Inc.: *See—*
Dunn, William M., 4,064,606, Cl. 29-25.420.
Hill, David A.; Pearson, Durk J.; Motley, Ethelyn P.; Beard, Thomas N.; and Farrell, James L., 4,065,183, Cl. 299-4.000.
Wahlers, Richard L.; and Merz, Kenneth M., 4,065,743, Cl. 338-308.000.
Tseo, Gudin, to Rohr Industries, Incorporated. Slanted cavity resonator. 4,064,961, Cl. 181-213.000.
Tsimbler, Jury Abramovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Lurie, Mikhail Vladimirovich; Topolyansky, Jury Arnoldovich; Kantor, Ilya Solomonovich; Chizhikov, Anatoly Petrovich; and Gun, Dmitry Rudolfovich, 4,065,076, Cl. 243-38.000.
Tsuchiya, Mitsuru: *See—*
Torigoe, Masao; Mori, Kunihito; Tsuchiya, Mitsuru; and Takemura, Seiji, 4,065,233, Cl. 417-368.000.
Tsuchiya, Tsutomu: *See—*
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; and Watanabe, Isamu, 4,065,616, Cl. 536-17.000.
Tsuji, Nobuo: *See—*
Sakaguchi, Shinji; Imai, Shinichi; Yamaguchi, Junn; and Tsuji, Nobuo, 4,065,435, Cl. 260-47.0UP.
Tsuneki, Takao; Takahashi, Norio; and Tashiro, Hirohisa, to Kurita Water Industries, Ltd. Slime control method. 4,065,387, Cl. 210-62.000.
Tunison, Donald E., Jr., to PPG Industries, Inc. Preparation of alkali-metal azides. 4,065,548, Cl. 423-410.000.

Turillon, Pierre Paul, to International Nickel Company, Inc., The. Powdered metal consolidation method. 4,065,302, Cl. 75-208.00R.

Turk, Chester F.: *See*—
Krapcho, John; and Turk, Chester F., 4,065,617, Cl. 542-450.000.

Turmer, Max: *See*—
Fastner, Thorwald; Niedermayr, Alois; Nakesch, Johann; and Turmer, Max, 4,064,925, Cl. 164-66.000.

Turpin, Lola, legal representative: *See*—
Ralston, John Pershing; Turpin, Warren Huntsman, deceased; and Turpin, Lola, legal representative, 4,064,992, Cl. 211-75.000.

Turpin, Warren Huntsman, deceased: *See*—
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Tuthill Pump Company: *See*—
Furlong, Donn Breen; and Londahl, Dickey Steele, 4,065,235, Cl. 417-420.000.

Uba, Toshio: *See*—
Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, 4,064,725, Cl. 72-147.000.

Uchida, Takanori: *See*—
Yamawaki, Takeshi; Uchida, Takanori; and Nakajima, Makoto, 4,065,426, Cl. 260-33.6AQ.

Uchida, Takashi: *See*—
Iwai, Naoji; Uchida, Takashi; and Abe, Takemi, 4,065,625, Cl. 428-596.000.

Uchiyama, Yasuji, to Nippon Gakki Seizo Kabushiki Kaisha. Frequency-deviation method and apparatus. 4,064,778, Cl. 84-1.250.

Ulivi, Moreno, to Saint-Gobain Industries. Apparatus for centering sheets of glass on the platform of a machine. 4,064,659, Cl. 51-277.000.

Ulland, Hartmut; Zimmermann, Volker; and Zuehlke, Rainer, to International Business Machines Corporation. Method and apparatus for determining stepping motor parameters from induced voltages. 4,065,708, Cl. 318-685.000.

Ullman, Edwin F.; and Rubenstein, Kenneth E., to Syva Company. Lysozyme conjugates for enzyme immunoassays. 4,065,354, Cl. 195-63.000.

Ulrich, Hans: *See*—
Laridon, Urbain Leopold; Delzenne, Gerard Albert; Mader, Helmut; Ulrich, Hans; and Seidel, Bernhard, 4,065,524, Cl. 260-895.000.

Ulrich, John, to Nu-Dell Plastics Corporation. Picture frame support. 4,065,091, Cl. 248-473.000.

Umene, Osamu: *See*—
Sakamoto, Yoshimasa; Iwanari, Sadayoshi; and Umene, Osamu, 4,065,741, Cl. 337-407.000.

Umezawa, Hamao; and Kondo, Shinichi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. δ-Substituted negamycin derivatives and syntheses. 4,065,495, Cl. 260-534.00M.

Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; and Watanabe, Isamu, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Processes for production of a 1-N-(α-hydroxy-Φ-amino alkanoyl)-3-deoxy-5-O-pentafuranosyl neamine and new compounds produced by the same processes. 4,065,616, Cl. 536-17.000.

Umezawa, Sumio: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; and Watanabe, Isamu, 4,065,616, Cl. 536-17.000.

Une, Katsumi: *See*—
Iwano, Yoshihiko; and Une, Katsumi, 4,065,352, Cl. 176-68.000.

Union Carbide Corporation: *See*—
Bailey, Frederick Eugene; von Dohlen, Werner Claus; Matzner, Markus; Young, Robert Hayward; and Robeson, Lloyd Mahlon, 4,065,520, Cl. 260-878.00B.
France, Haywood Gordon, 4,065,258, Cl. 8-142.000.
Grant, Andrew Campbell, 4,064,914, Cl. 138-142.000.
Hamer, Anthony David; and Karol, Frederick John, 4,065,612, Cl. 526-130.000.
Hamling, Bernard H.; and Naumann, Alfred W., 4,065,544, Cl. 423-252.000.
Salensky, George Anthony, 4,065,590, Cl. 428-35.
Walitalo, Charles R.; and Ericson, Alvin E., 4,064,776, Cl. 83-171.000.

Union Oil Company of California: *See*—
Dobashi, Harry H., 4,065,484, Cl. 260-449.60M.

Uniroyal: *See*—
Mirtain, Henri J., 4,065,338, Cl. 156-123.00R.

Uniroyal, Inc.: *See*—
Delaney, Edward A.; Pinkowski, Norman J.; and Nudenberg, Walter, 4,065,444, Cl. 260-880.00R.
Farber, Milton; Loveless, Frederick C.; and Peterson, Robert F., Jr., 4,064,922, Cl. 152-347.000.
Hen, John, 4,065,423, Cl. 260-29.70H.

Unisette Realty Ltd.: *See*—
Spinner, David, 4,064,679, Cl. 56-2.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Berry, Thomas Royston, 4,065,770, Cl. 343-5.0SC.
Gray, Kenneth Walter; and Rees, Huw David, 4,065,782, Cl. 357-23.000.

United States of America
Agriculture: *See*—
Roth, William B., 4,065,287, Cl. 71-13.000.
Tennes, Bernard R.; and Burton, Clyde L., 4,064,683, Cl. 56-328.0TS.
Army: *See*—
Apstein, Maurice; and Kalmus, Henry P., 4,064,806, Cl. 102-70.20R.
Ebner, Walter B.; and Walk, Charles Richard, 4,065,550, Cl. 423-464.000.
Lavertu, Roger R.; and Godbout, Antonin, 4,065,529, Cl. 264-3.00E.
Noble, Lowell; and Gaspar, James T., 4,065,370, Cl. 204-192.00N.
Vig, John R., 4,065,211, Cl. 356-152.000.
Zavitsanos, Peter D.; Golden, Joseph A.; and Alyea, Frederick N., 4,065,207, Cl. 350-312.000.
Energy: *See*—
Sheffield, George V., 4,065,350, Cl. 176-3.000.
Energy Research and Development Administration: *See*—
Andersen, John A.; and Harty, Gene R., 4,065,217, Cl. 403-24.000.
Bjorklund, William J., 4,065,400, Cl. 252-301.10W.
Jassby, Daniel L.; and Kulsrud, Russell M., 4,065,351, Cl. 176-5.000.
Roche, Michael F.; Faist, Suzan M.; Eberhart, James G.; and Ross, Laurids E., 4,065,602, Cl. 429-72.000.
Health, Education and Welfare: *See*—
Swett, Alan M.; and Swift, Roderick D., 4,065,066, Cl. 242-47.120.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Knoell, Albert C.; and Maxwell, Hugh G. Method of adhering bone to a rigid substrate using a graphite fiber reinforced bone cement. 4,064,566, Cl. 3-1.900.
National Aeronautics and Space Administration: *See*—
Dickerson, George E., 4,065,340, Cl. 156-154.000.
Johnson, James Edward; Foster, Tom; and Allan, Roy Duncan, 4,064,692, Cl. 60-261.000.
Kurtz, Robert L., 4,065,202, Cl. 350-3.500.
Progar, Donald J.; Bell, Vernon L.; and St. Clair, Terry L., 4,065,345, Cl. 156-309.000.
Vykukal, Hubert C.; Chambers, Alan B.; and St. John, Roy H., 4,064,642, Cl. 36-92.000.
Navy: *See*—
Ditter, Jerome F.; and Klusmann, Eugene B., 4,065,509, Cl. 260-606.50B.
Ess, John O., 4,064,783, Cl. 85-33.000.
Gulick, Joseph F.; and Marlow, Donald R., 4,065,771, Cl. 343-100.0SA.
Senger, Stephen J., 4,065,726, Cl. 330-288.000.
Thompson, John R., 4,065,746, Cl. 340-5.00S.
Wagner, Peter B., 4,065,765, Cl. 340-347.0DD.

U.S. Philips Corporation: *See*—
Elders, Marius J. A.; Vink, Nicolaas G.; and van Steen, Cornelis, 4,065,738, Cl. 335-213.000.
Gijrath, Johannes Henricus Nicolaas, 4,065,693, Cl. 313-406.000.
Lakerveld, Herman Gerard; and Rietdijk, Johan Adriaan, 4,065,674, Cl. 250-406.000.
Palfreeman, John S.; Redwood, Martin; Smith, Frederick W.; and Mitchell, Richard F., 4,065,735, Cl. 333-72.000.
Schomberg, Hermann; and Heubach, Frank, 4,065,808, Cl. 364-200.000.
van der Waal, Jan, 4,065,695, Cl. 313-466.000.

United States Steel Corporation: *See*—
Pringle, William L., 4,065,153, Cl. 280-704.000.

United Technologies Corporation: *See*—
Mercik, Henry J., Jr.; and Armstrong, Lee R., 4,064,746, Cl. 73-116.000.
Rackliffe, Richard J.; Goodfriend, Harvey J.; and Armstrong, Lee R., 4,064,747, Cl. 73-116.000.

United Turbine AB & Co.: *See*—
Kronogard, Sven-Olof, 4,064,690, Cl. 60-39.16R.

Universal Maschinenfabrik Dr. Rudolf Schieber KG: *See*—
Krause, Erich, 4,064,710, Cl. 66-157.000.
Krause, Erich; and Schieber, Hans, 4,064,711, Cl. 66-157.000.

University of Illinois Foundation: *See*—
Pandey, Ramesh C.; and Rinehart, Kenneth L., Jr., 4,065,384, Cl. 210-31.00C.

University of Virginia, The: *See*—
Stoner, Glenn E.; and Zardiackas, Lyle D., 4,064,629, Cl. 32-15.000.

Uno, Keiichi; and Miyagawa, Takahito, to Toyobo Co., Ltd. Copolyester and process for the production thereof. 4,065,439, Cl. 260-75.00R.

Unterweger, Heinz; and Gremaud, Maurice, to Sprecher & Schuh AG. Circuit arrangement in an electrical device operated with direct-current, especially in a timing relay. 4,065,805, Cl. 361-196.000.

UOP Inc.: *See*—
Hervert, George L., 4,064,829, Cl. 118-49.100.
Pulak, Richard P., 4,065,269, Cl. 23-288.00B.

Upjohn Company, The: *See*—
Andrews, Philip S.; Farrissey, William J., Jr.; Onder, Besir K.; and Tilley, James N., 4,065,441, Cl. 260-78.00R.
Axen, Udo F., 4,065,633, Cl. 560-121.000.
Lednicer, Daniel, 4,065,573, Cl. 424-278.000.
Magerlein, Barney J., 4,065,628, Cl. 560-53.000.
Magerlein, Barney J., 4,065,629, Cl. 560-5.00B.
Magerlein, Barney J., 4,065,631, Cl. 560-55.000.
Moon, Malcolm W.; and Sharp, John C., 4,065,574, Cl. 424-283.000.
Smith, Charles G., 4,065,556, Cl. 424-181.000.

Urbantsok, Janos: *See*—
Koroknay, Laszlo; and Urbantsok, Janos, 4,065,148, Cl. 280-432.000.

Ustredni statni veterinarni ustav: *See—*
Mukarovsky, Ladislav; Novak, Artur; and Kretschmer, Felix, 4,064,838, Cl. 119-14.080.

V. Kann Rasmussen & Co.: *See—*
Rasmussen, Villum Benedikt Kann; and Kann-Rasmussen, Lars Erik, 4,064,649, Cl. 49-250.000.

Valin, Norman A. Protective orthopedic device. 4,064,874, Cl. 128-80.00C.

Vallor, Ben J.: *See—*
Geiger, Paul B.; Grunewald, Ernst; and Vallor, Ben J., 4,064,887, Cl. 134-144.000.

Van Dyk Research Corporation: *See—*
Pollack, Maxwell Aaron, 4,065,335, Cl. 156-69.000.

Van Auken, Richard L., to Exxon Research and Engineering Company. Ski and method of making same. 4,065,150, Cl. 280-610.000.

van der Schaar, Wouter Wies: *See—*
Defares, Peter Bernard; van der Schaar, Wouter Wies; and Verveen, Eduard Theodorus, 4,064,869, Cl. 128-2.00R.

van der Waal, Jan, to U.S. Philips Corporation. Cathode ray tube screen having charge-retaining layer apertured in registration with color elements. 4,065,695, Cl. 313-466.000.

Van Horbek, Judd. Apparatus for mixing liquids. 4,065,107, Cl. 366-343.000.

van Steen, Cornelis: *See—*
Elders, Marius J. A.; Vink, Nicolaas G.; and van Steen, Cornelis, 4,065,738, Cl. 335-213.000.

Van Zwet, Henry: *See—*
De Beukelaar, Jan W.; Van Zwet, Henry; and Roest, Jacob B., 4,065,610, Cl. 526-70.000.

Varian Associates, Inc.: *See—*
Hill, Howard D. W., 4,065,714, Cl. 324-.50A.

Varta Batterie Aktiengesellschaft: *See—*
Lindenberg, Hans-Georg; Illmann, Joachim; and Golz, Hans-Joachim, 4,065,116, Cl. 269-22.000.

Vasseur, Jean Pierre: *See—*
Mayeux, Christian; Micheron, Francois; and Vasseur, Jean Pierre, 4,065,671, Cl. 250-370.000.

VCA Corporation: *See—*
Kirk, Donald C., Jr., 4,065,036, Cl. 222-153.000.

Veba-Chemie AG: *See—*
Wessendorf, Richard; Sommer, August; and Birkelbach, Heinrich, 4,065,506, Cl. 260-601.00R.

Velsicol Chemical Corporation: *See—*
Anderson, Arnold L., 4,065,429, Cl. 260-45.95G.

Verbauwhede, Germain: *See—*
Buyssens, Noel; and Verbauwhede, Germain, 4,064,915, Cl. 139-425.00R.

Verborgt, Jozef, to Cabofina S. A. Process for production acid polyester resins and powder coating products prepared from said resins. 4,065,438, Cl. 260-75.00R.

Vercellone, Mario J.; and Travers, William S. Fishing lure. 4,064,646, Cl. 43-42.410.

Vereecke, Frank J.: *See—*
Hemsath, Klaus H.; and Vereecke, Frank J., 4,065,252, Cl. 432-77.000.

Vereinigte Aluminium-Werke AG: *See—*
Weckesser, Ernst; Sparwald, Volker; Reh, Lothar; Bohm, Eberhard; and Graf, Rolf, 4,065,271, Cl. 55-2.000.

Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft: *See—*
Kaan, Peter; and Beke, Gunther Rudolf, 4,064,963, Cl. 181-244.000.

Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
Fastner, Thorwald; Niedermayr, Alois; Nakesch, Johann; and Turmer, Max, 4,064,925, Cl. 164-66.000.

Verkaufsgesellschaft fur Teererzeugnisse (VfT): *See—*
Gemmeke, Wilfried; Werner, Heinrich; Echterhoff, Heinz; and Raulf, Erich, 4,065,296, Cl. 75-48.000.

Vernaleken, Hugo: *See—*
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; and Nouvertne, Werner, 4,065,436, Cl. 260-47.0XA.

Verveen, Eduard Theodorus: *See—*
Defares, Peter Bernard; van der Schaar, Wouter Wies; and Verveen, Eduard Theodorus, 4,064,869, Cl. 128-2.00R.

Verveur, Jean: *See—*
Maguer, Pierre; and Verveur, Jean, 4,065,748, Cl. 340-9.000.

Victor United, Inc.: *See—*
Groner, Norman Arlo, 4,064,862, Cl. 124-23.00R.
Helmick, James C., 4,064,863, Cl. 124-41.00A.

Vierling, Donald E. Method and apparatus for oxidizing a fuel in an internal combustion engine. 4,064,840, Cl. 123-3.000.

Vig, John R., to United States of America, Army. Precision X-ray diffraction system incorporating a laser aligner. 4,065,211, Cl. 356-152.000.

Vijayendran, Bheema Rao: *See—*
Gluck, Julius; and Vijayendran, Bheema Rao, 4,064,833, Cl. 118-646.000.

Vik, Kjeld. Stationary supporting structure. 4,064,669, Cl. 52-299.000.

Vimba, Vladimir Ivanovich: *See—*
Grigorenko, Anatoly Sergeevich; Kravchenko, Vasily Savelievich; Moroz, Jury Antonovich; Kortusov, Leonid Ivanovich; and Vimba, Vladimir Ivanovich, 4,064,733, Cl. 72-453.030.

Vincent, Riggi: *See—*
Warner, Richard F.; Billand, William; and Vincent, Riggi, 4,064,644, Cl. 40-152.000.

Vink, Nicolaas G.: *See—*
Elders, Marius J. A.; Vink, Nicolaas G.; and van Steen, Cornelis, 4,065,738, Cl. 335-213.000.

Vockenhuber, Karl: *See—*
Freudenschuss, Otto, 4,065,209, Cl. 352-72.000.

Vogel, Roger F.: *See—*
Swift, Harold E.; and Vogel, Roger F., 4,065,380, Cl. 208-89.000.

Vogt, Christoph, to Single Buoy Moorings Inc. Apparatus for the marine transshipment of a liquid. 4,064,820, Cl. 114-74.00R.

von der Crone, Jost: *See—*
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von Dohlen, Werner Claus: *See—*
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Vyboischikov, Felix Petrovich: *See—*
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Vykukal, Hubert C.; Chambers, Alan B.; and St. John, Roy H., to United States of America, National Aeronautics and Space Administration. Walking boot assembly. 4,064,642, Cl. 36-92.000.

W. H. Kuester K.G.: *See—*
Polke, Hans-Joachim, 4,064,685, Cl. 57-55.000.

W. M. Cissell Manufacturing Company: *See—*
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W. R. Grace & Co.: *See—*
Faid, Robert W.; and Reinhart, William F., 4,064,672, Cl. 52-726.000.

W. Schlafhorst & Co.: *See—*
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Wacker-Chemitronic Gesellschaft fur Elektronik Grundstoffe mbH: *See—*
Koppl, Franz; Griesshammer, Rudolf; and Hamster, Helmut, 4,065,533, Cl. 264-81.000.
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Wada, Masao: *See—*
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Wagner, Otto: *See—*
Frommer, Werner; Gericke, Horst; Keup, Uwe; Puls, Walter; Schmidt, Delt; and Wagner, Otto, 4,065,557, Cl. 424-181.000.

Wagner, Peter B., to United States of America, Navy. Pulse-width demodulator and information storage device. 4,065,765, Cl. 340-347.0DD.

Wagner, Walter D.: *See—*
Gayle, Harold R.; and Wagner, Walter D., 4,064,889, Cl. 137-68.00R.

Wahi, Chander M., to E. F. Johnson Company. Connector. 4,065,201, Cl. 339-103.00R.

Wahlers, Richard L.; and Merz, Kenneth M., to TRW, Inc. Resistor material, resistor made therefrom and method of making the same. 4,065,743, Cl. 338-308.000.

Waldecker, Donald E. Tire caliper. 4,064,632, Cl. 33-143.00D.

Walitalo, Charles R.; and Ericson, Alvin E., to Union Carbide Corporation. Apparatus for making tear resistant separable end-connected bags. 4,064,776, Cl. 83-171.000.

Walk, Charles Richard: *See—*
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Walsh, Michael M., to Eaton Corporation. Hoist load brake. 4,065,100, Cl. 254-167.000.

Walter, John W. A.C. bridge intrusion alarm system. 4,065,762, Cl. 340-285.000.

Walter, Lothar: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; Burkl, Erich; and Kiener, Heinz, 4,065,193, Cl. 308-233.000.

Walters, Ronald D., to Hygeia Corporation. Bedding draw sheet. 4,064,577, Cl. 5-334.00R.

Walther, William D., to Dayton-Walther Corporation. Dual flanged wide base tire carrying rim and wheel. 4,065,186, Cl. 301-12.00R.

Wang, Richard H. S.: *See—*
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Wang, Shing Chung, to Xerox Corporation. Tandem laser assembly. 4,065,731, Cl. 331-94.50G.

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Warner, Donald E.; and Oyama, George C., to Audiotronics Corporation. Headset. 4,065,645, Cl. 179-156.00R.
Warner, Richard F.; Billand, William; and Vincent, Riggi, to Dash, Arthur; and Reidel, Jay, part interest to each. Frame construction and corner clip apparatus. 4,064,644, Cl. 40-152.000.
Warolin, Christian Jean Marie: *See—*
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Watanabe, Hideomi: *See—*
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Webb, John; and Houghton, Alan, to Webbs Machine Design. Fruit peeling method. 4,065,582, Cl. 426-231.000.
Webb, Walter J., to Scott & Fetzer Company, The. Valve apparatus for expansible chamber. 4,065,237, Cl. 417-503.000.
Webber, John Alan, to Eli Lilly and Company. 3-(Substituted) vinyl cephalosporins. 4,065,620, Cl. 544-16.000.
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Weber, Robert W., to Servco Company, a division of Smith International, Inc., The. Underreamer having cutter arm position indication. 4,064,951, Cl. 175-45.000.
Weber, Rudiger, to Dr. Ing. h.c.F. Porsche AG, Firma. Tire filler valve arrangement. 4,064,897, Cl. 137-224.000.
Weckesser, Ernst; Sparwald, Volker; Reh, Lothar; Bohm, Eberhard; and Graf, Rolf, to Metallgesellschaft Aktiengesellschaft; and Vereinigte Aluminium-Werke AG. Process of separating hydrogen fluoride from gases. 4,065,271, Cl. 55-2.000.
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Weisenberger, Gottfried, to Effbe-Werk Fritz Brumme & Co. KG. Fluid control valve. 4,064,910, Cl. 137-627.500.
Weist, Herman C., to Weist Industries Inc. Bag forming method and apparatus. 4,065,344, Cl. 156-250.000.
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Weist, Herman C., 4,065,344, Cl. 156-250.000.
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Wertepny, Alexander W. Gauging instrument. 4,064,633, Cl. 33-147.00E.
Wescom, Inc.: *See—*
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Wessendorf, Richard; Sommer, August; and Birkelbach, Heinrich, to Veba-Chemie AG. Continuous process for refining glyoxal. 4,065,506, Cl. 260-601.00R.
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Weyant, Romer G. Door and method of making same. 4,064,655, Cl. 49-501.000.
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Whyte, Andrew; Gallup, William A.; Schenker, Barry A.; and Schulz, Robert A., to Diamond Shamrock Corporation. Electrolytic cell. 4,065,376, Cl. 204-263.000.
Whyte, Ian A.; and Haley, Paul H., to Westinghouse Electric Corporation. Distribution network power line communication system. 4,065,763, Cl. 340-310.00R.
Wicklund, Joseph B., Jr., to Opcon, Inc. Balanced low impedance differential input line preamplifier. 4,065,724, Cl. 330-252.000.
Wicks, Moye, III; Kubitschek, Hans E.; and King, William E., to Shell Oil Company. Level actuated apparatus for delivering chemicals. 4,064,572, Cl. 4-227.000.
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Wiggins, Douglas G.; and Kushall, Edward L., to Xerox Corporation. Programmable development control system. 4,065,031, Cl. 222-56.000.
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Wild, Hans; Jeckel, Guenter; Echte, Adolf; Zizlsperger, Johann; Reffert, Rudi Wilhelm; and Thielen, Gunter, to BASF Aktiengesellschaft. Process for the admixture of additives into plastics with simultaneous removal of volatile constituents. 4,065,532, Cl. 264-68.000.
Wildey, Allan J., to Eaton Yale Ltd. Vehicle drive and suspension system. 4,064,956, Cl. 180-24.050.
Williams, David R., to Plunkett, William O.; and Reavis, Robert E., part interest to each. Iris throttle adaptor. 4,064,857, Cl. 123-141.000.
Williams, Donald L.; and Baker, James T., to General Motors Corporation. Compliant grooved sealing ring for threadably secured assembly. 4,065,026, Cl. 220-304.000.
Willmore, Bruce Albert Edward, to Imperial Chemical Industries Limited. Polymerization process. 4,065,609, Cl. 526-61.000.
Wilson, James D., to Banner Metals Div. of Intercole Automation. Bulk mail container. 4,065,141, Cl. 280-33.99H.
Wilson, James R.; and Wise, Jerry P., to General Motors Corporation. Tape cassette player. 4,065,800, Cl. 360-137.000.
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Wolbrink, David W.; Budyak, Robert J.; Sellinger, Du Wayne M.; and Kaepernick, William A., to Broan Manufacturing Co., Inc. Receptacle for trash compactors. 4,064,798, Cl. 100-229.00A.
Wolf, Robert, to J. M. Voith G.m.b.H. Compression roller for paper producing machinery. 4,064,607, Cl. 29-116.0AD.
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Wong, Robert; and Hill, Homer G., to Owens-Corning Fiberglas Corporation. Reversible shear thinning gel forming coating composition for glass fibers. 4,065,417, Cl. 260-17.4CL.
Wood, William, to Harrison & Sons (High Wycombe) Limited; and Green Shield Trading Stamp Company Limited. Sachet for the attachment of stamps, tokens and like devices to containers. 4,064,645, Cl. 40-159.000.
Woodbridge, Richard G., III. Analytical test strip apparatus. 4,065,263, Cl. 23-253.0TP.
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Wu, Chin Tao, to RCA Corporation. Multiply-divide unit. 4,065,666, Cl. 364-759.000.
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Wunderlich, Langley H., to General Motors Corporation. Arrangement and method of drum brake spring attachment. 4,064,978, Cl. 188-331.000.
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Yamai, Fumito; Ishida, Tomohiko; and Ikeda, Yoshinori, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Process for the preparation of expandable styrene polymer particles. 4,065,411, Cl. 260-2.50B.
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Yamawaki, Takeshi; Uchida, Takanori; and Nakajima, Makoto, to Mitsubishi Chemical Industries, Ltd. Method for the preparation of powdered rubber. 4,065,426, Cl. 260-33.6AQ.
Yamazaki, Toshio; Cook, Harriet J.; and Lipson, Melvin A., to Dynachem Corporation. Phototropic dye system and photosensitive compositions containing the same. 4,065,315, Cl. 96-48.0QP.
Yasuda, Tetsuya; Iinuma, Yoshio; Maekawa, Yuzo; Kato, Toshikiyo; and Yoshida, Masaru, to Citizen Watch Co., Ltd. Electronic timepiece with electro-optical display. 4,064,689, Cl. 58-50.00R.
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Young, Richard E.; and Ostolski, Timothy D., to Young Fire Equipment Corporation. Electrical installation for fire engine tower or the like. 4,065,761, Cl. 340-271.000.
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Zanfini, Vincent. Carpet cutter. 4,064,627, Cl. 30-287.000.
Zap-Lok Systems International, Inc.: *See—*
Echols, Marvin C.; and Gruller, David L., 4,064,619, Cl. 29-458.000.
Zardiackas, Lyle D.: *See—*
Stoner, Glenn E.; and Zardiackas, Lyle D., 4,064,629, Cl. 32-15.000.
Zauner, John H., to National Union Electric Corporation. Thermal cells. 4,065,605, Cl. 429-112.000.
Zavitsanos, Peter D.; Golden, Joseph A.; and Alyea, Frederick N., to United States of America, Army. Programmable power attenuator for continuous CO_2 lasers. 4,065,207, Cl. 350-312.000.
Zehner, Lee R., to Atlantic Richfield Company. Process for the preparation of oxalate esters from carbon monoxide and an enol ether. 4,065,490, Cl. 560-204.000.
Zeidler, Johannes, to Alfred Gutmann Gesellschaft fur Maschinenbau. Device for blasting large and bulky workpieces. 4,064,656, Cl. 51-426.000.

Zellhoefer, Glenn F., to National Union Electric Corporation. Thermal cells and electrolyte composition therefor. 4,065,604, Cl. 429-103.000.

Zellmer, Neale A., to GTE Automatic Electric Laboratories Incorporated. DC-to-DC voltage converter employing a common transistor in both switching and multivibrator functions. 4,065,807, Cl. 363-16.000.

Zenith Radio Corporation: *See*—
DeVries, Adrian J., 4,065,789, Cl. 358-167.000.

Zielinski, Erich, to Eastman Kodak Company. Web transporting apparatus. 4,065,042, Cl. 226-92.000.

Zimmerman, William E., to Westvaco Corporation. Method and apparatus for detecting and controlling the caustic in paper pulp bleaching. 4,065,348, Cl. 162-49.000.

Zimmermann, Volker: *See*—
Ulland, Hartmut; Zimmermann, Volker; and Zuehlke, Rainer, 4,065,708, Cl. 318-685.000.

Zimmerschied, Wilford J.: *See*—
Fields, Ellis K.; Zimmerschied, Wilford J.; and Palmer, David A., 4,065,442, Cl. 260-78.410.

Zin-Plas Corporation: *See*—
Nelson, Merritt J., 4,065,216, Cl. 403-4.000.

Zizlsperger, Johann: *See*—
Wild, Hans; Jeckel, Guenter; Echte, Adolf; Zizlsperger, Johann; Reffert, Rudi Wilhelm; and Thielen, Gunter, 4,065,532, Cl. 264-68.000.

Złokarnik, Marko: *See*—
Spielberger, Georg; Wunderlich, Hermann; Klag, Gunther; and Złokarnik, Marko, 4,065,492, Cl. 260-508.000.

Zollner, Christine; Thiele, Gerhard; Zollner, Dieter; and Koziol, Konrad, to C. Conradty Nurnberg GmbH & Co. KG. Metal anode for electrochemical processes. 4,065,377, Cl. 204-290.00F.

Zollner, Dieter: *See*—
Zollner, Christine; Thiele, Gerhard; Zollner, Dieter; and Koziol, Konrad, 4,065,377, Cl. 204-290.00F.

Zuehlke, Rainer: *See*—
Ulland, Hartmut; Zimmermann, Volker; and Zuehlke, Rainer, 4,065,708, Cl. 318-685.000.

Zusser, Louis H., to Northridge Trading Company. Curling iron with stepped barrel. 4,065,657, Cl. 219-225.000.

Zytka, Bernard J. Substitute power supply and battery charger for battery operated apparatus. 4,065,710, Cl. 320-2.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF DECEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aizawa, Hiroshi; and Ogiso, Mitsutoshi, to Canon Kabushiki Kaisha. Electric control device for a camera. Re. 29,505, Cl. 354-235.000.

Canon Kabushiki Kaisha: *See*—
Aizawa, Hiroshi; and Ogiso, Mitsutoshi, Re. 29,505, Cl. 354-235.000.

Carding Specialists (Canada) Limited: *See*—
Varga, John Maximilian Jules, Re. 29,503, Cl. 417-492.000.

Combe Incorporated: *See*—
Lapidus, Herbert, Re. 29,501, Cl. 36-44.000.

Dawans, Francois; and Teyssie, Philippe, to Institut Francais du Petrole, des Carburants et Lubrifiants. Unsaturated hydrocarbons polymerization catalysts containing transition metal complexes and Bronsted acids. Re. 29,504, Cl. 526-135.000.

Institut Francais du Petrole, des Carburants et Lubrifiants: *See*—
Dawans, Francois; and Teyssie, Philippe, Re. 29,504, Cl. 526-135.000.

Jaronko, John C.; and Jaronko, John T., to Nutmeg Sanitation, Inc. Furnace apparatus. Re. 29,502, Cl. 110-14.000.

Jaronko, John T.: *See*—
Jaronko, John C.; and Jaronko, John T., Re. 29,502, Cl. 110-14.000.

Lapidus, Herbert, to Combe Incorporated. Deodorizer sheet material and insole. Re. 29,501, Cl. 36-44.000.

Nutmeg Sanitation, Inc.: *See*—
Jaronko, John C.; and Jaronko, John T., Re. 29,502, Cl. 110-14.000.

Ogiso, Mitsutoshi: *See*—
Aizawa, Hiroshi; and Ogiso, Mitsutoshi, Re. 29,505, Cl. 354-235.000.

Teyssie, Philippe: *See*—
Dawans, Francois; and Teyssie, Philippe, Re. 29,504, Cl. 526-135.000.

Varga, John Maximilian Jules, to Carding Specialists (Canada) Limited. Apparatus for use as a gas compressor or blower. Re. 29,503, Cl. 417-492.000.

LIST OF PLANT PATENTEES

Beyer, Frederick, to Stark Brothers Nurseries & Orchards Company. Peach tree-mutation of Loring variety. 4,170, 12-27-77, Cl. 43.000.

Carlton Rose Nurseries, Inc.: *See*—
McDaniel, Gayle Kent, 4,172, Cl. 20.000.

Conard-Pyle Company, The: *See*—
Jelly, Robert G., 4,173, Cl. 22.000.

Crisafulli, Guiseppe, Sr., deceased: *See*—
Crisafulli, Joseph, Jr., executor; and Crisafulli, Guiseppe, Sr., deceased, 4,169, Cl. 36.000.

Crisafulli, Joseph, Jr., executor; and Crisafulli, Guiseppe, Sr., deceased. Pear Tree. 4,169, 12-27-77, Cl. 36.000.

Diebold, David A., to Stark Brothers Nurseries & Orchards Company. Peach tree-mutation of Rio Oso Gem variety. 4,171, 12-27-77, Cl. 43.000.

Jelly, Robert G., to Conard-Pyle Company, The. Rose plant-charisma variety. 4,173, 12-27-77, Cl. 22.000.

McDaniel, Gayle Kent, to Carlton Rose Nurseries, Inc. Rose plant—volare variety. 4,172, 12-27-77, Cl. 20.000.

Stark Brothers Nurseries & Orchards Company: *See*—
Beyer, Frederick, 4,170, Cl. 43.000.
Diebold, David A., 4,171, Cl. 43.000.

LIST OF DESIGN PATENTEES

Abe, Isamu; and Sugioka, Takami, to Teijin Limited; and Teijin Seiki Co., Ltd. Winder for synthetic filament yarns. 246,785, 12-27-77, Cl. D15-66.000.

Alden, John S. Combination celestial display and restaurant building. 246,801, 12-27-77, Cl. D25-7.000.

American Optical Corporation: *See*—
Loughner, Larry G., 246,792, Cl. D16-65.000.

Amerock Corporation: *See*—
Clayton, LaVerne E., 246,759, Cl. D8-306.000.

Bladis, Robert F. Tray rack. 246,773, 12-27-77, Cl. D12-22.000.

Bode, Kurt; and Kramer, Jochen, to Rollei-Werke Franke & Heidecke. Motion picture camera. 246,786, 12-27-77, Cl. D16-4.000.

Bode, Kurt; and Kramer, Jochen, to Rollei-Werke Franke & Heidecke. Motion picture camera. 246,787, 12-27-77, Cl. D16-04.000.

Bonifant, Bern M., to Flex-a-lite Corporation. Fan for internal combustion engines. 246,794, 12-27-77, Cl. D23-165.000.

Bonifant, Bern M., to Flex-a-lite Corporation. Fan blade. 246,795, 12-27-77, Cl. D23-165.000.

Brandt, Larry A.; and Johnson, Bruce R. Parts cleaning brush. 246,747, 12-27-77, Cl. D4-02.000.

Brubaker, Curtis, to Filmation Associates. Vehicle. 246,772, 12-27-77, Cl. D12-1.000.

Brubaker, Curtis, to Filmation Associates. Vehicle. 246,775, 12-27-77, Cl. D12-90.000.

Brunswick Corporation: *See*—
Gruenhut, Joseph H., 246,805, Cl. D34-5.0BB.

Chou, Cheng-Chien: *See*—
Laymon, Stephen A.; and Chou, Cheng-Chien, 246,796, Cl. D23-165.000.

Clayton, LaVerne E., to Amerock Corporation. Bail pull. 246,759, 12-27-77, Cl. D8-306.000.

Cognata, Larry M., to Murray Ohio Manufacturing Co., The. Bicycle tank. 246,778, 12-27-77, Cl. D12-126.000.

Cognata, Larry M., to Murray Ohio Manufacturing Co., The. Bicycle tank. 246,779, 12-27-77, Cl. D12-126.000.

Cole, David C.: *See*—
Kelley, Craig B.; and Cole, David C., 246,761, Cl. D8-347.000.

Daniels, Genniel. Flower pot. 246,771, 12-27-77, Cl. D11-143.000.

DiMarchi, Silvio J.: *See*—
Goldman, Marvin A.; Goldman, Jerome N.; DiMarchi, Silvio J.; and Mesquida, Barbara A., 246,793, Cl. D23-4.000.

Dimiceli, Joseph W.; and Labra, Edgardo R. Utility pole adjustable insulator bracket. 246,762, 12-27-77, Cl. D8-364.000.

Ditto, Donald R. Plaque. 246,770, 12-27-77, Cl. D11-139.000.

Dyer, Margaret L. Robe and hood ensemble. 246,746, 12-27-77, Cl. D2-181.000.

Emhart Industries, Inc.: *See*—
Kelley, Craig B.; and Cole, David C., 246,761, Cl. D8-347.000.

Esposito, Patsy. Hand truck. 246,774, 12-27-77, Cl. D12-34.000.

Everest, Charles E., to Telatemp Corporation. Infrared thermometer. 246,766, 12-27-77, Cl. D10-57.000.

Filmation Associates: *See*—
Brubaker, Curtis, 246,772, Cl. D12-1.000.
Brubaker, Curtis, 246,775, Cl. D12-90.000.

Flex-a-lite Corporation: *See*—
Bonifant, Bern M., 246,794, Cl. D23-165.000.
Bonifant, Bern M., 246,795, Cl. D23-165.000.

Florists' Transworld Delivery Association: *See*—
Harshman, Arthur L.; and Messmer, James I., 246,749, Cl. D7-1.000.
Harshman, Arthur L.; and Messmer, James I., 246,750, Cl. D7-28.000.

Foster Grant Co., Inc.: *See*—
Marchi, Vitalino, 246,789, Cl. D16-65.000.

Fukuda, Kiyoshi; and Kajiwara, Daisuke, to Matsushita Electric Industrial Co., Ltd. Vacuum cleaner. 246,752, 12-27-77, Cl. D7-164.000.

Fukushima, Hisao; Watanabe, Katsuhito; and Watanabe, Tsutomu, to Oki Electric Industry Co., Ltd. Telephone set. 246,784, 12-27-77, Cl. D14-53.000.

GAF Corporation: *See—*
Simonelli, Robert M.; Miller, Paul D.; and Porcelli, V. Lorenzo, 246,788, Cl. D16-12.000.

Genova, Peter J. Combined fairway map, yard marker and ball washer for a golf course. 246,808, 12-27-77, Cl. D34-5.0CB.

Genova, Peter J. Combined fairway map, yard marker, ball washer and refuse receiver and bench for a golf course. 246,809, 12-27-77, Cl. D34-5.0CB.

Genova, Peter J. Combined fairway map, yard marker, refuse receiver, bench and ball washer for a golf course. 246,810, 12-27-77, Cl. D34-5.0CB.

Goldman, Jerome N.: *See—*
Goldman, Marvin A.; Goldman, Jerome N.; DiMarchi, Silvio J.; and Mesquida, Barbara A., 246,793, Cl. D23-4.000.

Goldman, Marvin A.; Goldman, Jerome N.; DiMarchi, Silvio J.; and Mesquida, Barbara A., to Penn-Plax Plastics, Inc. Aquarium filter. 246,793, 12-27-77, Cl. D23-4.000.

Gruenhut, Joseph H., to Brunswick Corporation. Air cushion game table. 246,805, 12-27-77, Cl. D34-5.0BB.

Hardy, Tommy R.; and Kneale, Collan B., to International Business Machines Corporation. Data-collection apparatus. 246,783, 12-27-77, Cl. D14-40.000.

Harshman, Arthur L.; and Messmer, James I., to Florists' Transworld Delivery Association. Oval bowl. 246,749, 12-27-77, Cl. D7-1.000.

Harshman, Arthur L.; and Messmer, James I., to Florists' Transworld Delivery Association. Round bowl. 246,750, 12-27-77, Cl. D7-28.000.

Hart, Henry. Locking device for vehicles. 246,760, 12-27-77, Cl. D8-341.000.

Heath Company: *See—*
Renken, Richard W., 246,780, Cl. D14-12.000.

Hodgson, Roy George: *See—*
Smyth, Norman Linfoot; and Hodgson, Roy George, 246,756, Cl. D8-91.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Ukai, Kiyoshi, 246,758, Cl. D8-303.000.

Ideal Security Hardware Corporation: *See—*
Waldo, Russell W., 246,757, Cl. D8-301.000.

Iezzi, William. Handle for ski pole or the like. 246,806, 12-27-77, Cl. D34-14.00D.

Instrument Systems Corporation: *See—*
Saiya, Robert F., 246,782, Cl. D14-36.000.

International Business Machines Corporation: *See—*
Hardy, Tommy R.; and Kneale, Collan B., 246,783, Cl. D14-40.000.

James Neill Holdings Limited: *See—*
Smyth, Norman Linfoot; and Hodgson, Roy George, 246,756, Cl. D8-91.000.

Jenkins, Charmaine A. Chewed gum disposal receptacle. 246,753, 12-27-77, Cl. D7-191.000.

Jermyn, Arthur C. Bite-wing dental x-ray film holder. 246,797, 12-27-77, Cl. D24-02.000.

Jermyn, Arthur Charles. Periapical exposure dental x-ray film holder. 246,798, 12-27-77, Cl. D24-2.000.

Johnson, Bruce R.: *See—*
Brandt, Larry A.; and Johnson, Bruce R., 246,747, Cl. D4-02.000.

Kajiwara, Daisuke: *See—*
Fukuda, Kiyoshi; and Kajiwara, Daisuke, 246,752, Cl. D7-164.000.

Kelley, Craig B.; and Cole, David C., to Emhart Industries, Inc. Key blank. 246,761, 12-27-77, Cl. D8-347.000.

Kelman, Pepi G. Bracelet. 246,768, 12-27-77, Cl. D11-4.000.

Kesler, Gerry Donald. Applicator for suntan lotions and other liquids. 246,804, 12-27-77, Cl. D28-7.000.

Klosk, Lawrence. Rubbish receptacle. 246,754, 12-27-77, Cl. D7-194.000.

Kneale, Collan B.: *See—*
Hardy, Tommy R.; and Kneale, Collan B., 246,783, Cl. D14-40.000.

Kozak, Raymond. Tie clip. 246,769, 12-27-77, Cl. D11-48.000.

Kramer, Jochen: *See—*
Bode, Kurt; and Kramer, Jochen, 246,786, Cl. D16-4.000.
Bode, Kurt; and Kramer, Jochen, 246,787, Cl. D16-04.000.

Krolopp, Rudolph William, to Motorola, Inc. Microphone or similar article. 246,781, 12-27-77, Cl. D14-12.000.

Labra, Edgardo R.: *See—*
Dimiceli, Joseph W.; and Labra, Edgardo R., 246,762, Cl. D8-364.000.

Laymon, Stephen A.; and Chou, Cheng-Chien, to Wallace Murray Corporation. Radiator cooling fan. 246,796, 12-27-77, Cl. D23-165.000.

Loughner, Larry G. Pair of spectacles. 246,790, 12-27-77, Cl. D16-65.000.

Loughner, Larry G., to American Optical Corporation. Pair of spectacles. 246,792, 12-27-77, Cl. D16-65.000.

Luedtke, Warren J., to S. C. Johnson & Son, Inc. Squeeze bottle. 246,763, 12-27-77, Cl. D9-2.000.

Marchi, Vitalino, to Foster Grant Co., Inc. Pair of spectacles. 246,789, 12-27-77, Cl. D16-65.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Fukuda, Kiyoshi; and Kajiwara, Daisuke, 246,752, Cl. D7-164.000.

Mesquida, Barbara A.: *See—*
Goldman, Marvin A.; Goldman, Jerome N.; DiMarchi, Silvio J.; and Mesquida, Barbara A., 246,793, Cl. D23-4.000.

Messmer, James I.: *See—*
Harshman, Arthur L.; and Messmer, James I., 246,749, Cl. D7-1.000.
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Miller, Paul D.: *See—*
Simonelli, Robert M.; Miller, Paul D.; and Porcelli, V. Lorenzo, 246,788, Cl. D16-12.000.

Mondragon, Ralph. House. 246,802, 12-27-77, Cl. D25-19.000.

Moore, Aaron C. Kite. 246,807, 12-27-77, Cl. D34-15.0AF.

Moore, Michael C. Motorized tricycle. 246,776, 12-27-77, Cl. D12-110.000.

Motorola, Inc.: *See—*
Krolopp, Rudolph William, 246,781, Cl. D14-12.000.

Murray Ohio Manufacturing Co., The: *See—*
Cognata, Larry M., 246,778, Cl. D12-126.000.
Cognata, Larry M., 246,779, Cl. D12-126.000.

Needham, Robert John. Electrical measuring instrument. 246,767, 12-27-77, Cl. D10-78.000.

Oki Electric Industry Co., Ltd.: *See—*
Fukushima, Hisao; Watanabe, Katsuhito; and Watanabe, Tsutomu, 246,784, Cl. D14-53.000.

Owens-Illinois, Inc.: *See—*
Veasy, John Paul, 246,764, Cl. D9-137.000.

Peeler, Donald H., to Sybron Corporation. Sphygmomanometer. 246,799, 12-27-77, Cl. D24-21.000.

Penn-Plax Plastics, Inc.: *See—*
Goldman, Marvin A.; Goldman, Jerome N.; DiMarchi, Silvio J.; and Mesquida, Barbara A., 246,793, Cl. D23-4.000.

Porcelli, V. Lorenzo: *See—*
Simonelli, Robert M.; Miller, Paul D.; and Porcelli, V. Lorenzo, 246,788, Cl. D16-12.000.

Renken, Richard W., to Heath Company. Microphone/encoder module. 246,780, 12-27-77, Cl. D14-12.000.

Rollei-Werke Franke & Heidecke: *See—*
Bode, Kurt; and Kramer, Jochen, 246,786, Cl. D16-4.000.
Bode, Kurt; and Kramer, Jochen, 246,787, Cl. D16-04.000.

Root, James R. Ice hammer. 246,755, 12-27-77, Cl. D8-77.000.

Rubbermaid Commercial Products Inc.: *See—*
Yonkers, Ronald C., 246,751, Cl. D7-129.000.

Rutledge, James T. Noisemaker for bicycle or the like. 246,777, 12-27-77, Cl. D12-114.000.

S. C. Johnson & Son, Inc.: *See—*
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Saiya, Robert F., to Instrument Systems Corporation. Stethoscope headset. 246,782, 12-27-77, Cl. D14-36.000.

Shindler, Anthony. Pair of spectacles. 246,791, 12-27-77, Cl. D16-65.000.

Simonelli, Robert M.; Miller, Paul D.; and Porcelli, V. Lorenzo, to GAF Corporation. Stereoscopic viewer. 246,788, 12-27-77, Cl. D16-12.000.

Smyth, Norman Linfoot; and Hodgson, Roy George, to James Neill Holdings Limited. Saw sharpener or the like. 246,756, 12-27-77, Cl. D8-91.000.

Steinberg, Mack. Cigarette and cigar holder. 246,803, 12-27-77, Cl. D27-02.000.

Sugioka, Takami: *See—*
Abe, Isamu; and Sugioka, Takami, 246,785, Cl. D15-66.000.

Sulek, Eugene Joseph, to Texas Instruments Incorporated. Digital wrist watch. 246,765, 12-27-77, Cl. D10-38.000.

Sybron Corporation: *See—*
Peeler, Donald H., 246,799, Cl. D24-21.000.

Teijin Limited: *See—*
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Teijin Seiki Co., Ltd.: *See—*
Abe, Isamu; and Sugioka, Takami, 246,785, Cl. D15-66.000.

Telatemp Corporation: *See—*
Everest, Charles E., 246,766, Cl. D10-57.000.

Texas Instruments Incorporated: *See—*
Sulek, Eugene Joseph, 246,765, Cl. D10-38.000.

Tricario, John R. Holder for a telephone directory. 246,748, 12-27-77, Cl. D6-131.000.

Ukai, Kiyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Handle grip for vehicle. 246,758, 12-27-77, Cl. D8-303.000.

Veasy, John Paul, to Owens-Illinois, Inc. Bottle. 246,764, 12-27-77, Cl. D9-137.000.

Waldo, Russell W., to Ideal Security Hardware Corporation. Combined door pull and escutcheon. 246,757, 12-27-77, Cl. D8-301.000.

Wallace Murray Corporation: *See—*
Laymon, Stephen A.; and Chou, Cheng-Chien, 246,796, Cl. D23-165.000.

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Watanabe, Tsutomu: *See—*
Fukushima, Hisao; Watanabe, Katsuhito; and Watanabe, Tsutomu, 246,784, Cl. D14-53.000.

Wong, Johnson N. S. Vial. 246,800, 12-27-77, Cl. D24-56.000.

Yonkers, Ronald C., to Rubbermaid Commercial Products Inc. Drain tray for a food service pan. 246,751, 12-27-77, Cl. D7-129.000.

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LIST OF DESIGN PATENTEES

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501	4,064,655

CLASS 51

33 W	4,064,657
110	4,064,658
277	4,064,659
283 R	4,064,660
424	4,064,661
426	4,064,656

CLASS 52

71	4,064,662
80	4,064,663
136	4,064,664
155	4,064,665
171	4,064,666
204	4,064,667
295	4,064,668
299	4,064,669
473	4,064,670
696	4,064,671
726	4,064,672

CLASS 53

3	4,064,673
23	4,064,674
54	4,064,675
77	4,064,676
123	4,064,677
183	4,064,678

CLASS 55

2	4,065,271
25	4,065,272
50	4,065,273
89	4,065,274
121	4,065,275
276	4,065,276
418	4,065,277

CLASS 56

2	4,064,679
11.9	4,064,680
121.45	4,064,681
327 A	4,064,682
328 TS	4,064,683

CLASS 57

35	4,064,684
55	4,064,685
140 J	4,064,686

CLASS 58

4 A	4,064,687
50 R	4,064,688
	4,064,689

CLASS 60

39.06	4,064,691
39.16 R	4,064,690
261	4,064,692
290	4,064,693
413	4,064,694
517	4,064,695
598	4,064,696
624	4,064,697
664	4,064,698
	4,064,699

CLASS 61

4	4,064,700
45 D	4,064,701
53.5	4,064,702
53.68	4,064,703

CLASS 62

2	4,064,705
26	4,065,278
64	4,064,706
374	4,064,707
510	4,065,279

CLASS 64

1 V	4,064,708

CLASS 65

3 A	4,065,280
19	4,065,281
28	4,065,282
30 E	4,065,283
114	4,065,284
182 R	4,065,285
229	4,065,286

CLASS 66

135	4,064,709
157	4,064,710
	4,064,711
192	4,064,712

CLASS 68

5 E	4,064,713

CLASS 70

18	4,064,714
	4,064,715
38 A	4,064,716
165	4,064,717
302	4,064,718
355	4,064,719
363	4,064,720
416	4,064,721
456 B	4,064,722

CLASS 71

13	4,065,287
76	4,065,288
82	4,065,289
94	4,065,290
95	4,065,291
99	4,065,292
100	4,065,293

CLASS 72

60	4,064,723
70	4,064,726
108	4,064,724
147	4,064,725
179	4,064,727
238	4,064,728
256	4,064,729
393	4,064,730
419	4,064,731
449	4,064,732
453.03	4,064,733
455	4,064,734

CLASS 73

1 R	4,064,735
5	4,064,736
17 R	4,064,737
32 A	4,064,738
	4,064,739
38	4,064,740
80	4,064,743
88.5 R	4,064,744
91	4,064,745
116	4,064,746
	4,064,747
117.3	4,064,748
152	4,064,749
194 R	4,064,750
207	4,064,751
302	4,064,752
304 C	4,064,753
313	4,064,754
	4,064,755
349	4,064,756
362 AR	4,064,757
398 AR	4,064,758
409	4,064,759
421 R	4,064,760
462	4,064,761
487	4,064,762
516 R	4,064,763
611	4,064,742
620	4,064,741
660	4,064,704

CLASS 74

2	4,064,764
6	4,064,765
473 R	4,064,766
491	4,064,767
528	4,064,768
878	4,064,769

CLASS 75

3	4,065,294
5	4,065,295
48	4,065,296
52	4,065,297
60	4,065,298
67 A	4,065,299
117	4,065,300
203	4,065,301
208 R	4,065,302
226	4,065,303

CLASS 76

37	4,064,770

CLASS 81

52.3	4,064,771
57.13	4,064,772

CLASS 82

38 A	4,064,773
45	4,064,774

CLASS 83

4	4,064,775
171	4,064,776

CLASS 84

1.03	4,064,777
1.25	4,064,778
314	4,064,779
	4,064,780
322	4,064,781
477 R	4,064,782

CLASS 85

33	4,064,783
41	4,064,784
62	4,064,785

CLASS 89

33 B	4,064,786
34	4,064,787

CLASS 91

395	4,064,788
417 R	4,064,789
492	4,064,790

CLASS 93

1 C	4,064,791
18	4,064,792

CLASS 96

1 LY	4,065,304
1 R	4,065,306
1 SD	4,065,305
1.5 R	4,065,307
	4,065,308
14	4,065,309
27 R	4,065,310
	4,065,311
48 QP	4,065,315
50 R	4,065,312
60 BF	4,065,313
115 R	4,065,314

CLASS 98

58	4,064,793

CLASS 99

304	4,064,795
330	4,064,796
341	4,064,797
474	4,064,794

CLASS 100

229 A	4,064,798

CLASS 101

93.02	4,064,799
93.14	4,064,800
147	4,064,801
327	4,064,802
415.1	4,064,803
451	4,064,804

CLASS 102

35	4,064,805
70.2 R	4,064,806

CLASS 104

7 A	4,064,807
148 MS	4,064,808

CLASS 105

167	4,064,809
378	4,064,810
476	4,064,811

CLASS 106

20	4,065,316
52	4,065,317
90	4,065,318
93	4,065,319
100	4,065,320
106	4,065,321

CLASS 108

36	4,064,812
60	4,064,813
64	4,064,814
129	4,064,815

CLASS 110

14	Re.29,502

CLASS 112

79 A	4,064,816
158 F	4,064,817
258	4,064,818

CLASS 113

55	4,064,819

CLASS 114

74 R	4,064,820
103	4,064,821
230	4,064,822

CLASS 115

17	4,064,823
41 HT	4,064,824

CLASS 116

81	4,064,825
114 Y	4,064,827
114.5	4,064,828
117 C	4,064,826

CLASS 118

49.1	4,064,829
57	4,064,830
303	4,064,831
323	4,064,832
646	4,064,833
	4,064,834

CLASS 119

1	4,064,835
3	4,064,836
5	4,064,837
14.08	4,064,838
15	4,064,839

CLASS 123

3	4,064,840
8.47	4,064,841
25 L	4,064,842
32 EA	4,064,844
	4,064,846
32 EJ	4,064,843
	4,064,847
32 G	4,064,845
41.54	4,064,848
75 B	4,064,849
	4,064,850
119 B	4,064,851
	4,064,853
119 E	4,064,852
139 AW	4,064,854
139 DP	4,064,855
140 R	4,064,856
141	4,064,857
148 DS	4,064,858
148 E	4,064,859
191 S	4,064,860
198 F	4,064,861

CLASS 124

23 R	4,064,862
41 A	4,064,863

CLASS 126

121	4,064,864
271	4,064,865
	4,064,866
	4,064,867
	4,064,868

CLASS 128

2 G	4,064,871
2 H	4,064,872
2 N	4,064,870
2 R	4,064,869
12	4,064,873
80 C	4,064,874
142.2	4,064,875
146.6	4,064,876
188	4,064,877
206	4,064,878
215	4,064,879
294	4,064,880
325	4,064,881
351	4,064,882

CLASS 132

93	4,064,883

CLASS 134

7	4,065,322
10	4,065,323
15	4,064,884
30	4,065,324
58 R	4,064,885
95	4,064,886
144	4,064,887
167 R	4,065,325
182	4,064,888

CLASS 137

68 R 4,064,889
73 4,064,890
98 4,064,891
110 4,064,892
115 4,064,893
116.5 4,064,894
216 4,064,895
218 4,064,896
224 4,064,897
240 4,064,898
269 4,064,899
315 4,064,900
351 4,064,901
370 4,064,902
375 4,064,903
454.5 4,064,904
499 4,064,905
529 4,064,906
614.17 4,064,908
614.2 4,064,907
625.48 4,064,909
627.5 4,064,910

CLASS 138

30 4,064,911
94 4,064,912
125 4,064,913
142 4,064,914

CLASS 139

425 R 4,064,915

CLASS 140

2 4,064,916
105 4,064,917
123.6 4,064,918

CLASS 141

7 4,064,919

CLASS 144

200 4,064,920

CLASS 148

2 4,065,326
6.21 4,065,327
12.7 B 4,065,328
18 4,065,329
31.55 4,065,330
36 4,065,331

CLASS 149

19.9 4,065,332

CLASS 151

38 4,064,921

CLASS 152

347 4,064,922
427 4,064,923

CLASS 156

40 4,065,333
68 4,065,334
69 4,065,335
4,065,336
78 4,065,337
123 R 4,065,338
149 4,065,339
154 4,065,340
187 4,065,341
203 4,065,342
212 4,065,343
250 4,065,344
309 4,065,345

CLASS 159

6 R 4,065,346

CLASS 160

354 4,064,924

CLASS 162

26 4,065,347
49 4,065,348
158 4,065,349

CLASS 164

66 4,064,925
82 4,064,930
154 4,064,926
244 4,064,927
264 4,064,928
433 4,064,929

CLASS 165

1 4,064,931
4,064,932
89 4,064,933
97 4,064,934

CLASS 166

63 4,064,935
75 R 4,064,936
162 4,064,937
236 4,064,938
253 4,064,939
281 4,064,943
295 4,064,940
300 4,064,941
303 4,064,942

CLASS 169

60 4,064,944

CLASS 172

4 4,064,945
710 4,064,946
781 4,064,947

CLASS 173

12 4,064,948
14 4,064,949
151 4,064,950

CLASS 174

23 R 4,065,635
52 S 4,065,636
87 4,065,637

CLASS 175

45 4,064,951
209 4,064,952
321 4,064,953

CLASS 176

3 4,065,350
5 4,065,351
68 4,065,352

CLASS 177

25 4,064,954
134 4,064,955

CLASS 178

23 R 4,065,638
69.1 4,065,639

CLASS 179

7.1 TP 4,065,640
15 AT 4,065,641
18 AH 4,065,643
18 B 4,065,642
18 GF 4,065,644
156 R 4,065,645
170 R 4,065,646
175.1 A 4,065,647
178 4,065,648

CLASS 180

24.05 4,064,956
27 4,064,957
66 A 4,064,958
139 4,064,959
155 4,064,967

CLASS 181

114 4,064,964
131 4,064,965
144 4,064,966
210 4,064,960
213 4,064,961
244 4,064,963
272 4,064,962

CLASS 182

13 4,064,968

CLASS 184

1.5 4,064,969
15 B 4,064,970

CLASS 187

29 R 4,064,971

CLASS 188

24 4,064,972
71.3 4,064,974
71.7 4,064,973
73.5 4,064,975
234 4,064,976
317 4,064,977
331 4,064,978

CLASS 192

53 F 4,064,979
58 B 4,064,980
141 4,064,981

CLASS 195

2 4,065,353
63 4,065,354
66 R 4,065,355
80 R 4,065,356
103.5 R 4,065,357
127 4,065,358
4,065,359
139 4,065,360

CLASS 196

98 4,065,361

CLASS 197

1 A 4,064,983
1 R 4,064,982
52 4,064,984
114 R 4,064,985

CLASS 198

326 4,064,986
604 4,064,987

CLASS 200

5 A 4,065,649
4,065,651
5 R 4,065,650
175 4,065,652
302 4,065,653

CLASS 203

58 4,065,362

CLASS 204

1 T 4,065,363
15 4,065,364
25 4,065,365
98 4,065,366
4,065,367
159.23 4,065,368
164 4,065,369
192 N 4,065,370
195 C 4,065,373
195 R 4,065,371
195 S 4,065,372
228 4,065,374
237 4,065,375
263 4,065,376
290 F 4,065,377
297 W 4,065,378

CLASS 206

44 R 4,064,988
428 4,064,989
494 4,064,990

CLASS 208

67 4,065,379
89 4,065,380
134 4,065,381

CLASS 209

313 4,065,382

CLASS 210

27 4,065,383
31 C 4,065,384
44 4,065,385
60 4,065,386
62 4,065,387
80 4,065,388
96 R 4,065,389
225 4,065,390
274 4,065,391
282 4,065,392
377 4,065,393

CLASS 211

49 R 4,064,991
75 4,064,992
85 4,064,993
153 4,064,994
187 4,064,995
191 4,064,996

CLASS 212

39 B 4,064,997

CLASS 213

69 4,064,998

CLASS 214

1 BV 4,065,001
1 C 4,065,000
1 SW 4,064,999
14 4,065,002
16.6 4,065,003
36 4,065,004
41 R 4,065,005
42 R 4,065,006
62 A 4,065,007
83.3 4,065,008
131 A 4,065,009
138 D 4,065,010
146 E 4,065,011
510 4,065,012
620 4,065,013
621 4,065,014
750 4,065,015

CLASS 215

6 4,065,016
211 4,065,017
231 4,065,018

CLASS 219

10.55 D 4,065,655
10.55 F 4,065,654
121 LM 4,065,656
225 4,065,657
386 4,065,658
398 4,065,659
535 4,065,660

CLASS 220

9 LG 4,065,019
18 4,065,020
22 4,065,021
71 4,065,022
75 4,065,023
203 4,065,024
258 4,065,025
304 4,065,026
343 4,065,027

CLASS 221

36 4,065,028

CLASS 222

3 4,065,029
55 4,065,030
56 4,065,031
77 4,065,032
107 4,065,033
146 HE 4,065,034
153 4,065,035
4,065,036
4,065,037
321 4,065,038

CLASS 224

2 B 4,065,039
5 D 4,065,040
42.1 D 4,065,041

CLASS 226

92 4,065,042
141 4,065,043
188 4,065,044

CLASS 227

147 4,065,045

CLASS 228

156 4,065,046

CLASS 229

41 C 4,065,047
43 4,065,048
55 4,065,049

CLASS 232

34 4,065,050
43.2 4,065,051

CLASS 235

419 4,065,662

CLASS 236

86 4,065,052

CLASS 237

1 A 4,065,053
8 R 4,065,054
12.1 4,065,055
67 4,065,056

CLASS 239

79 4,065,057
88 4,065,058
184 4,065,059

CLASS 241

16 4,065,060
81 4,065,061
101.7 4,065,062
275 4,065,063
299 4,065,064

CLASS 242

18 G 4,065,065
47.12 4,065,066
58.1 4,065,067
67.1 R 4,065,068
107.4 A 4,065,069
4,065,070
4,065,071
107.7 4,065,072
131 4,065,073
184 4,065,074
199 4,065,075

CLASS 243

38 4,065,076

CLASS 244

54 4,065,077
104 FP 4,065,078
152 4,065,079
155 A 4,065,080

CLASS 246

34 R 4,065,081

CLASS 248

9 4,065,082
19 4,065,083
117.1 4,065,084
124 4,065,085
188.6 4,065,086
201 4,065,087
242 4,065,088
245 4,065,089
318 4,065,090
473 4,065,091
503 4,065,092

CLASS 250

214 P 4,065,668
229 4,065,669
315 A 4,065,670
370 4,065,671
372 4,065,672
402 4,065,673
406 4,065,674
445 T 4,065,397
576 4,065,675

CLASS 251

6 4,065,093
26 4,065,094
118 4,065,095
137 4,065,096
228 4,065,097

CLASS 252

8.1 4,065,394
25 4,065,395
33.4 4,065,396
108 4,065,398
182 4,065,399
301.1 W 4,065,400
350 4,065,401
358 4,065,402
4,065,403
4,065,404
415 4,065,405
443 4,065,406
463 4,065,407
522 4,065,408
528 4,065,409

CLASS 254

29 A 4,065,098
164 4,065,099
167 4,065,100
184 4,065,101
186 HC 4,065,102

CLASS 256

11 4,065,103
13.1 4,065,104

CLASS 260

2.5 AM 4,065,410
2.5 B 4,065,411
8 4,065,412
9 4,065,413
17 R 4,065,414
17.4 CL 4,065,417
17.4 SG 4,065,415
4,065,416
23 XA 4,065,418
28.5 D 4,065,419
29.2 N 4,065,420
29.4 R 4,065,421
29.6 E 4,065,422
29.7 H 4,065,423
31.8 DB 4,065,424
33.6 AQ 4,065,426
33.6 EP 4,065,425
45.75 B 4,065,428
45.8 NT 4,065,427
45.95 G 4,065,429
47 C 4,065,431
4,065,432
47 ET 4,065,434
47 UA 4,065,430
4,065,433
47 UP 4,065,435
47 XA 4,065,436
49 4,065,437
75 R 4,065,438
4,065,439
4,065,440
78 R 4,065,441
78.41 4,065,442
79.5 B 4,065,443
112 B 4,065,445
146 D 4,065,446
163 4,065,447
176 4,065,448
4,065,449
239 B 4,065,450
239.3 D 4,065,451
239.55 D 4,065,452
250 P 4,065,454
289 K 4,065,457
289 R 4,065,456
289 XA 4,065,455
293.55 4,065,458
294.8 C 4,065,459
4,065,460
296 AE 4,065,461
299 4,065,462
307 A 4,065,463
326 N 4,065,471
326.15 4,065,464
4,065,465
327 M 4,065,466
332.2 C 4,065,472
340.5 R 4,065,473
345.2 4,065,467
346.71 4,065,469
346.75 4,065,468
4,065,470
347.7 4,065,474
348.29 4,065,476
348.31 4,065,475
369 4,065,477
382 4,065,478
429 L 4,065,479
429.9 4,065,480
438.1 4,065,481
448.2 E 4,065,482
449.5 4,065,483
449.6 M 4,065,484
464 4,065,485
465 C 4,065,487
465.3 4,065,486
467 4,065,488
502.5 4,065,491
508 4,065,492
514 D 4,065,493
4,065,494
534 M 4,065,495
561 R 4,065,496
563 P 4,065,497
566 F 4,065,498
567.6 M 4,065,499
4,065,500
570.6 4,065,501
590 R 4,065,502
592 4,065,503
600 R 4,065,504
4,065,505
601 R 4,065,506
604 R 4,065,507
606.5 B 4,065,509
613 R 4,065,508
632 B 4,065,510
635 R 4,065,511
641 4,065,512
656 R 4,065,513
676 R 4,065,514
683.47 4,065,516
683.68 4,065,515
823 4,065,517
836 4,065,518
857 TW 4,065,519
878 B 4,065,520
879 4,065,521
880 R 4,065,444
4,065,522
885 4,065,523
895 4,065,524
989 4,065,525

CLASS 261

62 4,065,526
79 A 4,065,527
114 R 4,065,528

CLASS 264

3 E 4,065,529
41 4,065,530
4,065,531
68 4,065,532
81 4,065,533
91 4,065,534
94 4,065,535
98 4,065,536
143 4,065,537
154 4,065,538
251 4,065,539
278 4,065,540
295 4,065,541

CLASS 266

69 4,065,109
78 4,065,110
138 4,065,111

CLASS 267

34 4,065,112
156 4,065,113

CLASS 269

2 4,065,114
16 4,065,115
22 4,065,116

CLASS 270

58 4,065,117

CLASS 271

14 4,065,118
172 4,065,119
174 4,065,120
4,065,121
201 4,065,122
215 4,065,123

CLASS 272

65 4,065,124

CLASS 273

5 R 4,065,125
58 A 4,065,126

81 D 4,065,127
85 D 4,065,128
121 A 4,065,129
130 AB 4,065,130
134 B 4,065,131
153 R 4,065,132
167 E 4,065,133

CLASS 274

37 4,065,134
39 R 4,065,135

CLASS 277

3 4,065,136
34 4,065,137
230 4,065,138

CLASS 279

62 4,065,139

CLASS 280

11.37 E 4,065,140
33.99 B 4,065,142
33.99 H 4,065,141
43.23 4,065,143
87.02 R 4,065,145
278 4,065,146
432 4,065,148
4,065,149
477 4,065,147
610 4,065,150
618 4,065,151
668 4,065,152
704 4,065,153
707 4,065,154
744 4,065,155
747 4,065,156
751 4,065,157
771 4,065,144

CLASS 282

27.5 4,065,158

CLASS 285

136 4,065,159

CLASS 292

92 4,065,160
113 4,065,161
340 4,065,162
341.15 4,065,163
347 4,065,164
348 4,065,165

CLASS 296

23 G 4,065,166
28 C 4,065,167
28 M 4,065,168
35 R 4,065,169
37.1 4,065,170
97 E 4,065,171

CLASS 297

19 4,065,172
45 4,065,173
66 4,065,174
130 4,065,175
304 4,065,176
327 4,065,177
341 4,065,178
384 4,065,179
4,065,180
452 4,065,181
4,065,182

CLASS 299

4 4,065,183
34 4,065,184
86 4,065,185

CLASS 301

12 R 4,065,186

CLASS 307

66 4,065,676
112 4,065,677
214 4,065,680
237 4,065,678
246 4,065,681
251 4,065,679
261 4,065,682
264 4,065,683
279 4,065,187

CLASS 308

10 4,065,188
4,065,189
15 4,065,190
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